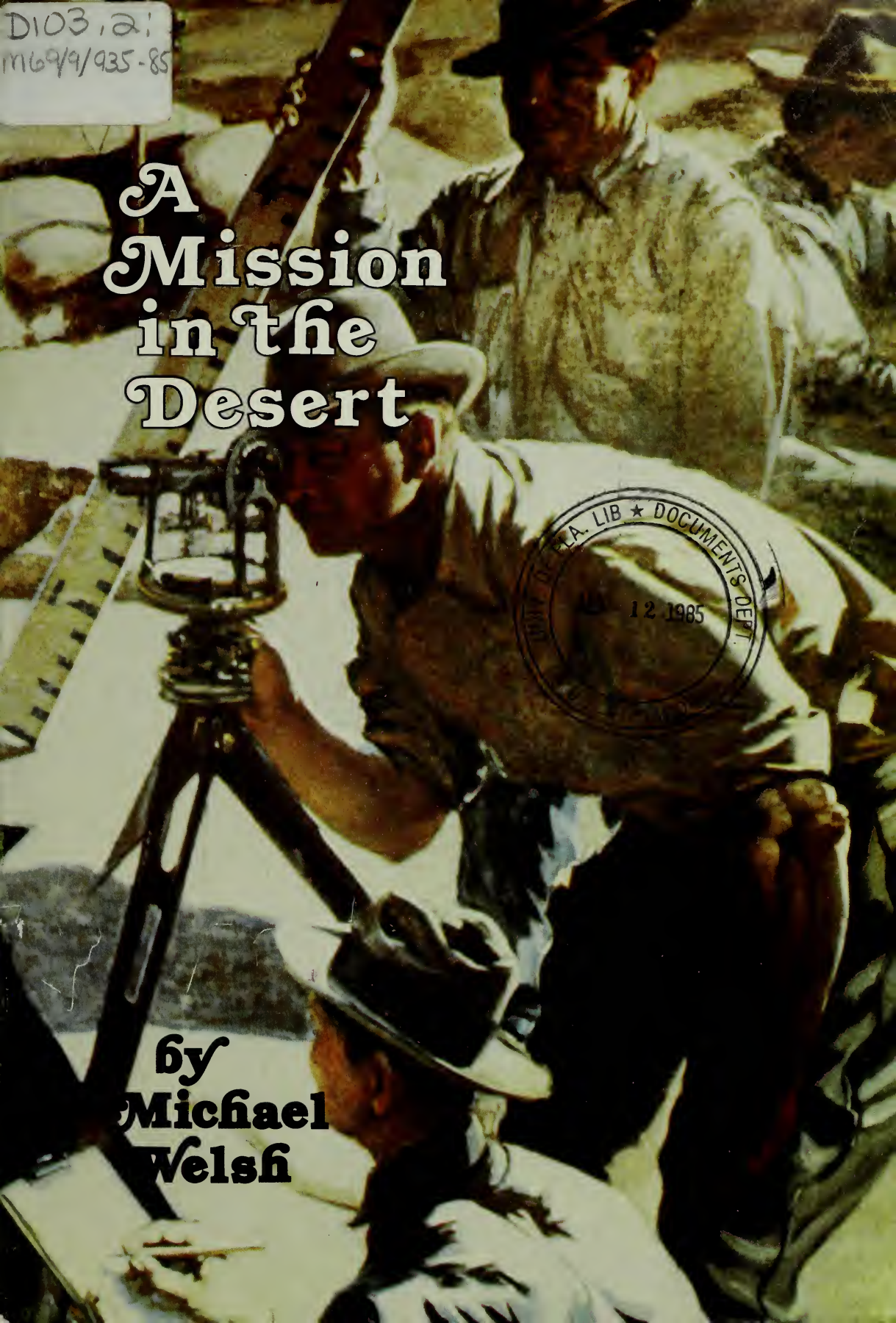
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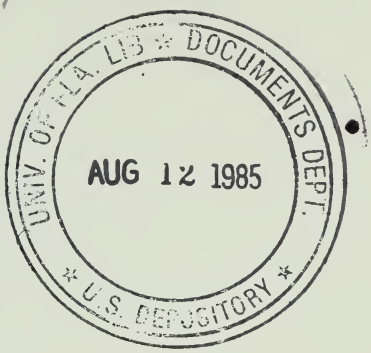
A Mission in the Desert



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A MISSION IN THE DESERT
ALBUQUERQUE DISTRICT
1935-1985

by Michael E. Welsh



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FOREWORD

The accomplishments of the Albuquerque District, U. S. Army Corps of Engineers encompass 50 years of accelerating growth in the American Southwest. For the Albuquerque District, it all began in 1935. But for the Army Engineers, it all began much earlier - more than a century ago when the U. S. Topographical Engineers began to probe the region. This important era of Engineer exploration and mapping provided information for future expansion into the Southwest during and after the War with Mexico in 1846. The early data was also useful in gaining later Congressional support for railroad construction, which was the first major step in the development of the region by the United States. When the Army Engineers came into New Mexico in 1935 to construct its first project near Tucumcari, the Engineers began to develop a knowledge of the political, climatic, cultural, and economic uniqueness of the region, and the Albuquerque District has subsequently developed an expertise in the needs and realities of the land and its inhabitants. The contributions of the District are woven into the fabric of expansion whereby the Southwest has entered the mainstream of national development.

In this history of the Albuquerque District and of the early engineer explorers, the thoughts, writings, and theories of many Army personnel have been collected. The contributions of the Army Engineers began with Lieutenant Zebulon Pike's explorations of the southern Rockies in 1806, and were followed by Major Stephen Long's journey along the Rocky Mountain Front Range in 1819 and 1820. Surveys by engineers Abert and Peck in New Mexico in 1847 were succeeded by additional surveys by Lieutenant George Wheeler in the 1870s. The present District's origins began as the Tucumcari (later Conchas) District during the construction of Conchas Dam and then the name was changed to the Caddoa District during the construction of John Martin Dam and Reservoir in Colorado. The District moved to Albuquerque when World War II began and there it has remained. However, it has always looked to the North and South to satisfy the needs of Colorado, Texas, and Kansas. The contributions of the District to the War effort and to the very future of the world were enormous with the construction of military facilities and with the District's involvement at Los Alamos in the development of the atomic bomb. Following World War II the District constructed six other major dams for flood control and many smaller flood protection projects for communities of the Southwest. The District's military construction role continued as well until 1970 when the mission was moved to another district. Future plans include planning and construction of additional flood protection projects, as funded by Congress, and use of our engineering expertise to aid military, local, state, and federal agencies.

Corps of Engineers personnel have shown themselves ready and able to wisely develop the resources of the Southwest and have committed themselves to a philosophy of professionalism in all endeavors. This book eloquently describes our role in the development of the Southwest as the human story it is — the plans and hopes, the decisions and defeats, and, most often, the successes. The Corps' motto is "Essayons," Let Us Try, and, in trying we have provided our services as a resource development agency, as a local unit of the federal government in cases of civil emergency, and as a source of engineering knowledge for Southwest engineering problems.

Our goal in preparing this history, *A Mission in the Desert,* is to begin a record of the contributions of the Army Engineers in the Southwest. The Albuquerque District is proud of the 50 years it has devoted to excellence in the missions assigned to us by the Nation. This is the story of our efforts. For the future, I see the growth of ourselves and of the region we serve. I know we will continue to meet the challenge ahead with the same tenacity for excellence that has been the trademark of the District for the past 50 years.

David E. Peixotto
Lieutenant Colonel, CE
Commander

INTRODUCTION

In many ways, analysis of the Albuquerque District, U. S. Army Corps of Engineers, is central to an understanding of life in the modern Southwest. The expertise and technological acumen of the Corps devised means by which the postwar Sunbelt lifestyle could develop. Whether through its water projects that created flood protection and recreational benefits, or its military construction and the appurtenant economic growth, the Albuquerque District played a major role in shaping the destiny of New Mexico, West Texas, and Southern Colorado.

Historians of the Southwest are now coming to realize another aspect of the 20th century development in which the Albuquerque District participated. That is the influence of corporate and governmental organizations on the future of the region. The history of the 19th century Southwest emphasized the role of the individual and his or her struggle against the environment and hostile forces around them. While this story had moments of high drama, it often failed to explain why the Southwest became an urban and technological mecca of the 1980s.

To answer that question, then, one must look to the exploits of large institutions with the requisite capital, personnel, and experience to resolve complex issues of economic and social advancement. Individuals by themselves could not protect against periodic flooding in the southwestern river basins, nor could they fashion the infrastructure of the military-industrial complex that anchors the regional economy. But by working collectively through such organizations as the Albuquerque District, the citizenry could triumph over the obstacles of distance, isolation, and limited rainfall that had influenced other cultures for generations prior to the 20th century.

The wisdom of this growth, and the merits of the contributions of the Albuquerque District, will be debated as long as the projects remain. As this book goes to press, the Rio Grande basin carries a large volume of spring runoff from northern New Mexico, and joins the waters transferred via the San Juan-Chama Diversion Project into the heart of New Mexico. Storage of these waters to protect low-lying areas and summer irrigation schedules threatens wildlife habitats and recreational sites cherished by the state's urban dwellers. The compromise pleases few individuals and demonstrates the high degree of complexity that has confronted every venture undertaken by the Albuquerque District. Perhaps this study will shed some light in the dark corners of southwestern water policy, and help succeeding waves of migrants understand why we live the way that we do.

No endeavor of the magnitude of this book could reach completion without the involvement of many people at every stage of development. The assistance and knowledge of Dr. Gerald D. Nash kept the research and writing on track, and also clarified the many mysteries present in the history of the 20th century West. Thanks are also due to the staff of the Albuquerque District, especially Marie Farnsworth, Chief, Office of Administrative Services. Her sense of history and knowledge of the labyrinth of the bureaucracy brought the manuscript to its ultimate conclusion. Also helpful in this regard was John T. Greenwood, Chief, Historical Division, Office of the Chief of Engineers, Fort Belvoir, VA. John and his staff, including Paul Walker, Martin Reuss, and Frank Schubert, guided the original research and commented on the merits of the manuscript.

The personnel at the Federal Records Centers in Suitland, MD, and Fort

Worth, TX, offered their services with the many documents generated by a federal agency. The special collections departments at the University of New Mexico and the University of Colorado, as well as the State Archives and Records Office in Santa Fe, New Mexico, all were most cooperative. A special thanks goes to Stan Hordes, State historian for New Mexico, who worked closely on the direction of the manuscript on many levels. Thanks also to the staff of the Lyndon Baines Johnson Presidential Library in Austin, Texas.

The political and economic leadership of the region gave generously of their time to advise the author of the intricacy of Albuquerque District history. These include the three Rio Grande Compact Commissioners: Steve Reynolds, Jesse Gilmer, and Jeris Danielson. U. S. Senator Pete V. Domenici offered much insight during his hectic schedule, and former U. S. Senator Gordon Allott, and U. S. Congressman J. Edgar Chenoweth, both of Colorado, showed great insight into the politics of western water.

The retirees of the Albuquerque District were one of the best sources of information, equally for their grasp of political and economic reality as for their knowledge of engineering. James A. Loughridge and James L. Redmond kept a close watch on the manuscript. The project managers of the District's facilities gave willingly of their time, as did many personnel at headquarters. Lt. Col. Julian E. Pylant took great interest in the subject matter, and Lt. Col. David. E. Peixotto offered his services to write the preface to the manuscript. Without Norm Brown's grasp of New Mexico history and his knowledge of Southwestern geology, many details of the District's work would have been in error.

The final task of organizing the manuscript into printed form benefited from the assistance of Ms. Mariana Ibanez, who typed the drafts and final version. Larry D. Ball, Jr., helped with the completion as well. Special thanks must go to my wife, Cindy, whose patience and perseverance made the long journey shorter and less taxing. She endured endless conversations about defense spending and water policy with good humor, and shows few ill effects from the experience.

I

SCIENCE AND TECHNOLOGY IN THE EARLY SOUTHWEST

As befits the region and the people that it serves, the Albuquerque District of the U.S. Army Corps of Engineers has a history that is brief in chronology but long and varied in reality. Where other districts encompass activities of coastal and harbor improvements, the Albuquerque District is the only mountain and desert entity among the 38 Corps districts in the United States. Its presence in an area of many cultures, geologic and geographic phenomena, and engineering challenges creates circumstances often unknown to other Corps offices. For these reasons the Albuquerque District must be grounded in the larger perspective of the Southwest, and its accomplishments measured not only by comparison to the rest of the nation, but by its place in the flow of regional developments.

The connection of the Army Engineers in the Southwest extends to the days of Major Stephen H. Long, a Topographical Engineer who journeyed along the Front Range of the Rocky Mountains in 1819-1820 and then turned eastward through the Arkansas River valley, a watershed that the Albuquerque District maintains with John Martin Dam and Reservoir near Lamar, Colorado. From this tentative effort of survey and reconnaissance to today's role as construction manager of the experimental Waste Isolation Pilot Program [WIPP], east of Carlsbad, New Mexico, the Corps of Engineers has provided a broad range of public services. These have included water projects, recreational facilities, flood control, irrigation storage, and military construction. Together, they affect the ways in which the citizens of the District live, work and play. As the Albuquerque District prepares to enter its second half-century in 1985, it can look back with pride on its achievements, reassess its more challenging tasks, and draw lessons for the future from its function as a public servant in one of the fastest-growing areas of the United States.

The word that best describes the history of the Albuquerque District is "diversity," whether in geography, climate, size, population mixture, or the projects it has undertaken. While younger than most Corps districts in the eastern United States, and despite having fewer residents within its boundaries, the Albuquerque District has faced obstacles not present in the more-settled portions of the country. In this regard the District mirrors the history of the Southwest as a whole. The region contains the earliest native societies and the oldest permanent European communities. In addition, the Southwest has unique features of distance, isolation, hydrology, and weather that confront all individuals who make it their home.

These factors of nature and cultural development worked to create a part of the United States that moved to its own rhythm. This often frustrated those who attempted to dominate its people or its lands. In his pathbreaking study of the western environment, *The Great Plains,* Walter Prescott Webb argued that Americans on the frontier had to rethink their place in nature because



Plate No. 1. Captain Hans T. Kramer

they could not find an abundance of the three commodities essential to life in the East: good soil, good timber, and good rainfall. The Topographers of the 19th century commented at length on these conditions, and the surveyors and planners of the first Southwestern Corps water projects, Conchas and Caddoa Dams, relearned the wisdom of their forebearers that bringing water to the arid lands would be the only means of sustaining large populations migrating from wetter climates.[1]

This lesson of adopting humanity to the environment of the Southwest had surfaced even before Stephen Long, John Charles Fremont, and their contemporaries ventured out to study the great unknown of the West in the 19th century. Two hundred years earlier the Spaniards had established a permanent colony on the banks of the Rio Grande, at its junction with the Rio Chama. In 1598 Don Juan de Onate brought a party of soldiers, priests, and settlers to the Pueblo Indian village of Ohkeyamungue, renamed San Juan by the Spanish. Until the arrival of the United States Army under General Stephen Watts Kearney in 1846, the Southwest's resources and water supply were the focus of contention between native and colonist. Evidence of this was the Pueblo Revolt of 1680, when the native peoples along the Rio Grande drove out the foreign masters who had sought to change their religions, languages, customs, and ways of life. After an absence of 12 years, the Spanish returned to these communities, having learned to share the limited resources of New Mexico with the Indians.

The resettlement of the Southwest coincided with a change in the royal administration in Spain. There the French ruling family, the Bourbons, assumed the throne in Madrid and brought new life to the declining Spanish empire. In later years these policies came to be known as the "Bourbon reforms," and encompassed the financial, political and religious life of the Spanish New World. Among these directives was the creation of an elite group of highly trained military personnel called the Royal Corps of Engineers. The Spanish Crown installed the Engineers in 1711, in response to the disastrous conclusion of the War of Spanish Succession in Europe. Over the course of six decades the Royal Engineers incorporated many of the ideas of the European Enlightenment, especially its attention to scientific and technical research and experimentation. Its policies became part of the military mission of the Spanish, most notably in the northern areas of the empire known as the Provincias Internas.[2]

The arrival of the Royal Engineers in the Southwest complemented attempts by the Spanish government to redesign its Indian policies, and to promote increased settlement of the region. By the 1760s the nomadic tribes of Apaches, Navajos, Utes and Comanches had mastered the use of Spanish horses and weaponry, creating a balance of power that favored the natives. Their centuries-old raiding practices increased in response to retaliatory measures instituted by the Spanish after 1700. The Spanish system of defense concentrated in establishment of permanent garrisons called "presidios." These proved almost useless against the more mobile Indian bands of the Southwest. To insure adequate protection for Spanish citizens, as well as the Pueblo villages that allied themselves with Spain, the royal government dispatched two officials to the Southwest to survey the needs of the territory and recommend necessary changes.[3]

One of these individuals was Jose de Galvez. He was sent to undertake fiscal reform of the northern provinces, and to locate new sites for mission activity. Galvez also designed fortifications to protect the silver mines of northern Mexico, and reorganized the operations of government. His military counterpart,

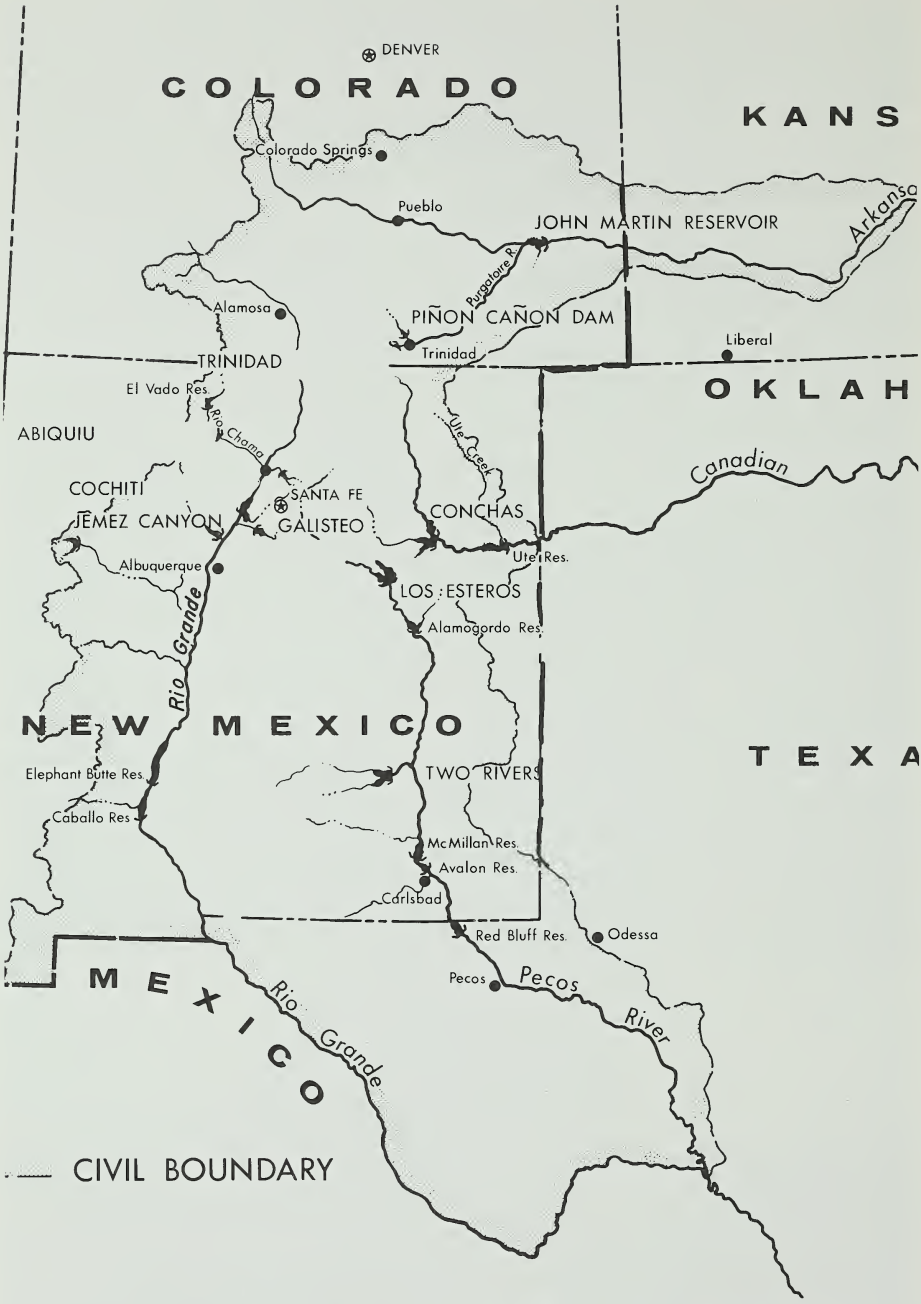


Plate No. 2. Flood Protection Boundaries Albuquerque District

the Marques de Rubi, carried orders to inspect all posts and garrisons in the region. Rubi appointed Nicholas de Lafora of the Royal Engineers as his assistant, and together they mapped a new strategy for Spanish defense that endured until the departure of royal authority in 1821.

Upon completion of their journey in 1768, Rubi and Lafora assembled a series of reports, sketches and charts that outlined the core of Spanish military deficiencies. In its desire to protect its territory from foreign invaders, whether English and French from the east or Russian to the west, the crown had overextended itself. Lafora and Rubi recommended that Spain determine the most valuable possessions and protect them at all costs. Lafora ventured from the Papago villages at the juncture of the Gila and Colorado rivers in southwestern Arizona, to Taos, New Mexico, on the north, and the Sabine river in Texas to the east. The diary of his journey went through several printings, as it included detailed analyses of the Indian villages, water courses, mineral deposits, flora and fauna, and suggestions for roads and trails. His map served as the official source of information for the Spanish government, and his writing style, thoroughness of description, and accuracy of astronomical observations revealed the high degree of skill and training that he possessed.

Rivaling the success of Lafora was another Royal Engineer, Miguel de Costanso, who assisted Gaspar de Portola and Father Junipero Serra in their plans to settle the territory of Upper California. Because of his work in surveying that area, Costano received orders to provide expert guidance for a variety of topographic and cartographic enterprises in the 1770s and 1780s. In 1776 he drew a map of a proposed route from Santa Fe, capital of the Provincias Internas, to Monterey, seat of government in California, and to Tubac, south of Tucson, Arizona. Although he had not traveled these distances, Costanso corresponded with such notables as Pedro Fermin de Mendinueta, governor of New Mexico, and Father Silvestre de Escalante, a missionary stationed at the western New Mexico pueblo of Zuni.

From their references Costanso estimated the mileage by measuring the known latitudes and longitudes, then adding reasonable distances to compensate for the topography. His final report stated that the Santa Fe-Tubac route was 690 miles, and the journey to Monterey would be 1,150 miles. The accuracy of his estimates is seen in the modern highway mileage of 704 miles to Tubac, and 1,118 miles to Monterey. The information came at the same time that Juan Bautista de Anza pioneered a route overland from Tubac to California, and also when Father Francisco Garces ventured along the Colorado River to visit the Indian villages at Hopi and Zuni. Costanso's data also helped Father Escalante and his partner, Father Francisco Dominguez, seek out a route from Santa Fe north along the Rio Chama into southern Colorado and Utah in 1776.

The Royal Engineers operated in many capacities in the Spanish attempts to bring peace to the Southwest between 1765 and 1800. Geronimo de la Rocha, for example, served as engineer to General Anza in 1785 when he fought with the New Mexico Apaches, Comanches, and Utes. But the services of the Royal Engineers ended as the government of Spain weakened after 1790, precipitating the many revolutions of Central and South America in the early 19th century. The Royal Engineers received orders to move from the Borderlands and to join the Spanish Army as it sought unsuccessfully to stem the tide of rebellion. But their departure did not diminish their importance to the region. As well-educated and well-trained officers, the Royal Engineers often brought new ideas of science and technology to remote areas of the Spanish empire. Their maps,

charts, and reports provided a wealth of detail and information about the peoples, resources, and problems of the Southwest. It is an unfortunate irony of history that the next wave of explorers, which included the U.S. Army Corps of Topographical Engineers, did not avail themselves of the knowledge gained by their Spanish counterparts.

The motivations of the successors to the Royal Corps differed sharply from those of the Spanish government. Whereas the Spanish empire had long been in decline, collapsing soon after 1800, the new United States possessed an abundance of energy, curiosity and bravado. This posture became the philosophy of Manifest Destiny, and spawned a rapid progression of settlers from east of the Appalachians in 1783 to the shores of California and Oregon by 1850. In such a short span of time, and with technological limitations, the hardy pioneers crossed the continent and prompted the call for development that still exists in the 20th century West.

As agents of the United States military, defenders of the westward movement, and as highly intelligent technicians and scientists, the Corps of Topographical Engineers brought a focus to the West and Southwest lacking among the more individualistic mountain men, fur traders, gold seekers, and adventurers. Before their absorption in 1863 into the main body of the Army Engineers, the Topographers had delineated the nation's boundaries, built wagon roads and military posts, constructed rivers and harbors improvements on the West Coast, and drilled wells and erected diversion dams in the arid Southwest. They recorded a vast fund of information on the plant and animal life of the West, the Indian and Hispanic cultures living there, and routes for railroads, sites for towns, and locations for water projects and irrigation systems.[4]

The U.S. Army Corps of Engineers had its origins in 1775, when General George Washington directed several officers to prepare breastworks at Breed's Hill in Boston prior to the Battle of Bunker Hill. Until 1803 there was no specific agency responsible for military construction. But at that time Congress created the Corps of Engineers and ordered them to provide assistance to the Army and Navy in matters of coastal defense. Congress had established the Military Academy at West Point, New York, in 1802. In its early days it graduated only engineer officers and was the only training school in the nation until the 1820s. In the 1830s the duties of the Corps came to include surveys and reconnaissance missions in the interior of the country. Congress then decided to separate this function from the general organization of the military engineers, and in 1838 formed the Corps of Topographical Engineers.

Given their West Point schooling, their continuing study of the latest methods of science and engineering, and their acquaintance with the leading technical minds of the United States and Europe, the Engineers quickly became a unique force in the frontier West. The Engineers also had a familiarity with the prevailing literary and social movement of the mid-19th century known as Romanticism. This school of thought held that the observer of natural phenomena recorded all measurable data for its intrinsic value, the better to "know all nature." Poets like Ralph Waldo Emerson, Henry Wadsworth Longfellow, and others preached of the grandeur of nature, and to the engineering mind of the day, everything had relevance and merit. A wealth of documentation on every conceivable subject in the West was generated, as well as a collection of hundreds of crates of specimens, samples, and souvenirs from the journeys of the Topographers.

In their desire to "know all that there was to know" about the American

frontier, the Engineers discovered that they had need of political allies who often did not share their sense of beauty nor their professional standards. These were local government officials and promoters of national expansion who saw in the studies of the Topographers a blueprint for growth and riches. These individuals seized their opportunity when the United States' policies toward the West were ill-formed, the technology limited, and when the national passion for mobility entered an advanced stage. The rapid growth of the interior required dramatic responses, and the Corps had to rely upon its training in science to guide it through the pitfalls of Congress. Then, as honors went to such glamorous figures as John C. Fremont, other young engineer officers rushed to make names for themselves in the West, joining forces with local entrepreneurs only too eager to provide the Corps with a justification for its work. By the mid-1850s, however, Congress would find little amusement in the pleas of the Engineers for more funding. The outbreak of the Civil War saw an end to the Topographers, and a return to their military mission in the original Corps of Engineers.

The first American military officer to venture into the Southwest was the young Lieutenant Zebulon Pike, sent by President Thomas Jefferson in 1806 to find the source of the Red River in the southern Rockies. He also traced the boundary of the recently acquired Louisiana Territory with the Spanish province of Texas. Upon reaching the Arkansas River near present-day La Junta, Colorado, Pike sent a portion of his command down river to return to the east, while he searched for the headwaters of that stream in the nearby Rocky Mountains. Forced to spend the winter in the valleys above modern-day Pueblo, Pike traveled over La Veta Pass to the Rio Grande, where he met a force of Spanish soldiers. They arrested the trespassing American, took him to the New Mexican capital of Santa Fe, and then incarcerated him in a Spanish prison in Chihuahua. Upon his release, Pike returned to Washington and utilized his powers of recall to fashion maps and a report that served as a source of information on the region for a half century. Among Pike's conclusions was the belief that Spanish citizens of New Mexico would welcome trade with the Americans because U.S. goods were more durable and cheaper than those offered by Spanish merchants. His observations would later stimulate the famed Santa Fe trade of the pre-Civil War years.

The Southwest entertained no more representatives of the United States Army until 1819, when Major Stephen H. Long, of the Topographical Bureau, traveled up the Platte and South Platte Rivers to the Rockies, and headed south to the Arkansas River. Long became the first American officer to journey down the Canadian River, which he mistook for the boundary of Texas. Long exhibited no great love for his task, refusing to seek out the headwaters of the three rivers that he encountered. More importantly, however, was the tone of his report in 1820 entitled, "General Description of the Country Traversed by the Exploring Expedition." Long judged the Southwest to be a "great American Desert," "wholly unfit for cultivation and . . . uninhabitable by a people depending upon agriculture for their subsistence." Long contended that the High Plains of eastern Colorado, New Mexico, and west Texas were fit only "as a range for buffalos, wild goats, and other wild game." The scarcity of wood and water, he argued, would "prove an insuperable obstacle in the way of settling the country." Long could not have foreseen the changes brought to the region by the Army Engineers' construction of John Martin Dam and Reservior in southeastern Colorado, or of the Conchas Dam in eastern New Mexico. These dams permitted

cultivation of thousands of acres of marginal lands, and overcame the contentions of many that the region offered Americans no worthwhile future.[5]

For the next 20 years the Army did not sponsor investigations of the Southwest. This was in part because of its involvement in the Indian wars and removal programs in the Old Northwest and the Southeast, and because of President Andrew Jackson's dislike for internal improvements expenditures. The only sources of information about the region came from mountain men, untrained in scientific exploration and more concerned with survival than with aesthetics or economic potential. Nor were there science and engineering schools in the region that would accept the data which the Engineers collected in later years. Only with the establishment of the Smithsonian Institution in 1846 and the science degree programs of Yale and Harvard in the 1860s would the nation appreciate the Army Engineers' empirical study of the West.

As the Industrial Revolution took hold in America prior to the Civil War, the pressure for resources, new markets, and areas of settlement generated momentum for expansion. The Army Engineers played a key role in the westward rush after 1842 and found answers to the new questions posed by Manifest Destiny. The prototype of this new Engineer officer was John Charles Fremont, one of the few Topographers without a degree from West Point. Brash, articulate, intelligent, and the son-in-law of the foremost advocate of expansion, Senator Thomas Hart Benton of Missouri, Fremont as much as any other individual brought national attention to the work of the Corps. He enlisted the aid of Benton to procure funds for survey and reconnaissance work, and served as a bridge between scientific objectivity and the nationalistic partisanship that disturbed some in Congress. The Topographers wished to demonstrate their particular expertise in the cause of national development, and for the next dozen years a host of Corps-sponsored surveys and studies covered the interior West and Southwest. Many pioneers followed Fremont's advice in their journeys to California and Oregon. His acceptance in influential circles in Washington spurred others in the Topographical Bureau to emulate his style, retrace his footsteps, and bring advancements of civilization to the newly acquired lands of the West.

Although Captain Fremont spent little time in the Southwest, he dispatched two Topographers from his 1845 reconnaissance to travel south from Bent's Fort, a major trading post on the Arkansas River, to the Canadian River in west Texas and eastern New Mexico. Lieutenant James W. Abert, a nephew of the Chief of Topographical Engineers, John James Abert, joined with Lieutenant William G. Peck to explore an area that the U.S. government coveted from Mexico, and which soon became part of the Mexican Cession in 1848. Their journey took them up the Purgatoire River, over Raton Pass, and along the Sangre de Cristo mountains to the headwaters of the Canadian River near Raton, New Mexico. Abert commented at length on the natural beauty of the region, and noted that the existence of precious metals would make it a "great mineral country." His descriptions of the Kiowa and Comanche people, moreover, became the first official evidence the Army had on these two tribes. His commentary on the possibilities for travel and settlement in the region also made the Canadian valley one of the popular routes for Southwestern travel in the 1850s and later.[6]

The knowledge gained by Abert and Peck proved valuable to the U.S. Army when it detailed another western reconnaissance party in 1846. The "Army of the West" under General Stephen W. Kearney traveled to New Mexico and captured the Southwest as part of the War with Mexico. Kearney employed as a

Topographical Engineer a young first lieutenant, William H. Emory, who had connections with the eastern aristocracy and scientific community. Emory recruited Abert and Peck to assist him, and used their maps and charts to guide Kearney's army into the territory. Emory recognized the large bituminous coal deposits south of Raton Pass that later became the scene of extensive mining activities after the Civil War. He then came upon the ruins of Pecos Pueblo northeast of Santa Fe, inspiring in him theories of ancient Indian migrations from the Aztec civilizations of Mexico. Emory marveled at the syncretic nature of New Mexico Catholicism, wherein the old Pecos church had an altar at one end for conducting Mass, while the other end contained the remnants of a perpetual ceremonial fire that Emory believed honored the Aztec ruler Montezuma.

Once in Santa Fe, Emory began writing reports about the new territory, declaring it an "all-important military possession for the United States." The level route from Fort Leavenworth to Santa Fe would make a fine corridor for railway travel, said Emory, and one day the region would grow prosperous from the benefits of this trade. Less prescient were his suggestions that farming and mining would be major factors in the local economy of Santa Fe. He also surmised that grape cultivation could make New Mexico a center for the production of wine.

When Kearney and his soldiers departed for California in 1847, they left behind Engineers Abert and Peck to recover from illness. The Topographers had orders to make a thorough survey of the new military district of New Mexico, charting the locations of all resources, towns, and tribes of Indians. One of their projects was a search in western New Mexico for Coronado's fabled Seven Cities of Gold. Abert and Peck followed the Rio Puerco to the Rio San Jose, where they encountered the villages of the Laguna and Acoma peoples, and Spanish farmers and sheepherders. The Engineers found no silver or gold, only large amounts of ruins, and a "quiet and generous people" living at a subsistence level. Abert concluded that the Pueblos had descended from the Aztecs, concurring with Emory and sparking debate with other scholars who argued otherwise.[7]

Prior to 1848 the activities of the Topographical Engineers in the West consisted of small surveying parties and service to the Regular Army. The conclusion of the War with Mexico changed their mission, and thrust them intoan international spotlight. Congress ordered the Corps to study the boundary between the United States and Mexico, marking its dimensions and reporting on its natural phenomena. Because negotiations on the precise delineation required knowledge of geography and cartography, the Engineers realized that their opinions carried much weight with diplomats on both sides of the border. The federal government had no clear idea of its intentions in the Southwest, except for fulfilling the spirit of Manifest Destiny. This enmeshed the work of the Engineers in the Congressional debates over sectionalism, the expansion of slavery, and the "All-Mexico Movement," where prominent politicians and newspaper editors clamored for seizure of as much Mexican territory as possible.

The results of the boundary survey revealed the tensions under which the Engineers labored, and how differences of opinion generated friction for many years. The line between New Mexico and Chihuahua had been mapped privately in 1825, and contained such errors as locating El Paso some 40 miles north of its actual coordinates. Nicholas Trist, chief negotiator in Mexico City for the U.S. State Department, had written to Emory in 1847 requesting information on El Paso. The lieutenant's departure for California left no one to reconnoiter the southern portion of the territory. Of concern to Mexican diplomats was the

status of El Paso, since it lay on the south side of the Rio Grande. Mexico wanted the border town to be part of the state of Chihuahua, and included in the Treaty of Guadalupe Hidalgo language stating that any new boundary would "run north of the town called Paso."

Mexico's representatives to the boundary commission thus claimed all the lands of the Rio Grande valley north to Mesilla, and west along the Gila River to San Diego. This would give Mexico the potential wealth of the Mesilla Valley and the community of El Paso, which at the time prospered from the traffic of California gold seekers. The Topographers convinced the Mexican officials to relent in their demands, and in 1851 the commission drew the line at 32°22'. This was still north of El Paso but south of the Gila River. After extended discussion and debate fueled by Southern politicians seeking an all-weather railroad route to California, the United States agreed to the Gadsden Purchase of 1853, wherein the government paid Mexico $15 million for the lands south of the Gila and north of the present-day boundary.

As the work on the Mexican Boundary continued, the U.S. government also directed the Topographical Engineers to return to the Southwest and travel through that area. The specific motive was a transcontinental railroad route, even though the technology of the early 1850s made such an enterprise questionable. In addition, the government requested surveys of wagon roads in other parts of the West. These would provide for the delivery of mail, transport of troops and supplies, as well as settlement and growth. Defense against Indian attacks became crucial, as the press of settlers onto Indian lands created competition for resources. The process was one of stimulus and response, so that the distinctions between military necessity and public demand quickly blurred. This left the Topographical Engineers in the awkward position of alienating one segment of the political spectrum [southern and eastern Congressmen], as it aided another [western territories]. The consequences would be more work for the Topographers through the middle of the decade, followed by gradual removal of the Corps from the West by the 1860s.

The first of these reconnaissances to the Southwest came in response to petitions from residents of Fort Smith, Arkansas. They saw their community on the Canadian River as a future hub of Southwestern commerce and travel, not unlike St. Louis's domination of the corridor to Oregon and Santa Fe. Congress authorized a study of routes to California via Fort Smith and Santa Fe. The Army dispatched Captain Randolph B. Marcy with a party of emigrants to New Mexico, including Topographer Lieutenant James H. Simpson. The Marcy contingent utilized the maps of Abert, finding them correct in every detail. The success of the 1849 journey led Marcy to offer the Canadian valley as the best route for a Pacific railway. Simpson's engineering mind was more cautious, acknowledging the lack of snow, the level of terrain, abundance of timber and coal, and the absence of the need to bridge major streams. Yet Simpson also warned that the vast distance to be covered and the sparse population meant few travelers and fewer markets for eastern goods. Simpson felt the "boomer" spirit of the Southwest had to be checked by reality, and that railroad development prior to orderly settlement made little sense.[8]

Upon arrival in Santa Fe in 1848, Simpson received orders to join a punitive expedition west into the Navajo country. There he discovered the most remarkable remnants of Indian cultures in the West. The U.S. Army had encountered a hornet's nest of raiding and retaliation between the nomadic Indians of New Mexico and the towns and settlements along the Rio Grande. In promising

to halt practices that were centuries old, and appearing to choose sides with the Pueblo and Hispanic peoples of the region, the Army unwittingly triggered attacks from the Apache and Navajo bands of the area. To meet the needs of defense, as well as to negotiate treaties with these people, the Army fanned out across the territory to hunt down suspected raiders and bring in band chiefs for discussions.

As he prepared to accompany the Navajo expedition, Simpson filed his report on the journey from Fort Smith, admitting his lack of affection for his new home. He found the land naked and barren, the earth tones of the adobe houses drab, the native foods of chile and tortillas nauseating, and the people of an inferior quality. In spite of this bias, Simpson sent back to Washington a balanced and competent report, thanks in large measure to his employment of two young artists and draftsmen from the Fremont surveys, Edward and Richard Kern.[9]

The Kern brothers proved invaluable to Simpson in the preparation of his report, especially with their ability to improvise and their striking portrayals of the Marcy journey taken wholly from Simpson's notes. Simpson enlisted the Kerns on his trip among the Navajos, and the trio returned with the most descriptive comments and sketches on the peoples and environment of the region yet to date. Their first stop came at Jemez Pueblo, west of Santa Fe, where the Indians regaled them with stories of their history and customs, performed their rituals and songs, and explained the Jemez vision of the world.

The experience at Jemez touched Simpson and the Kerns deeply, and brought out in them the strains of Romanticism that each had learned while studying in the east. Removed from centers of population, they became enraptured by the beauty of their surroundings and the complexity of the lives of the Indian peoples. Yet even their sense of the dramatic did not prepare them for their discoveries in the badlands west of Jemez Pueblo, where they came upon dozens of ruins covering hundreds of square miles. The explorers left the Army camp as it moved on and spent days detailing and describing the area known as Chaco Canyon. They gave names to various sites, many of which are still used today, and speculated on the origins and development of people that possessed such wealth and power.

After leaving Chaco, the Kerns and Simpson caught up with Colonel John M. Washington and his party, following them on their route to Canon de Chelly and other parts of eastern Arizona and western New Mexico. As scientists they marvelled at the many Indian rock carvings interspersed with the names and dates of Spanish passersby on Inscription Rock, west of modern-day Grants, New Mexico. Before their departure Simpson and Richard Kern took tracings of the writings, and then added their names to the collection.

The report filed by Simpson in 1850 benefited as much from the work of the Kerns as had the earlier Canadian river summary. The two brothers tried to soften the Lieutenant's dislike of New Mexico. In time all three cultivated a fascination for the history of the region, and Richard Kern studied Spanish so as to translate 16th century Spanish documents housed in the Palace of the Governors in Santa Fe. The Kerns found the New Mexican capital an exhilarating place, remaining to organize Simpson's journals and astronomical observations, and to draw maps for the official report. The Kerns then performed topographical work for Simpson and his successor, Lieutenant John Pope, and collected dozens of specimens for submission to the National Academy of Science.[10]

The Simpson-Kern report contributed much to the understanding of the United States about New Mexico, in large part because of their humanistic

training and their scientific approach to the natural environment. Simpson wrote a detailed narrative of the New Mexico Indian societies, and fashioned a comparative vocabulary that revealed the existence of six different linguistic groups among these people. His report constituted the first official American eyewitness account of the region west of the Rio Grande, and served as a guide to such later students of the Southwest as Lewis Henry Morgan and Adolph Bandelier. Said William Goetzman, author of *Army Exploration in the American West, 1803-1863:* "No work on these pueblos is complete without reference to Simpson's researches."[11]

In those first years following acquisition of the Southwestern territory, the work of the Topographical Engineers received high praise from scholars and politicians alike. Their studies, specimens, and cartography aided in advancing knowledge of the region, while the perceived threat of Indian warfare justified their service to the nation's defense. It was when the Topographers branched out into areas of "public works," especially the Pacific railway surveys and the construction of wagon and post roads, that the Engineers attracted unwanted criticism from eastern and western interests alike. From these controversies would come a restricted Corps presence in the Southwest by 1860.[12]

The United States Army had played a major role in opening the West for expansion since the early 19th century. The westward movement is filled with examples of small frontier communities petitioning the federal government for better transportation and communications to guarantee access to eastern markets and potential settlement. Rivers and harbor improvements, flood control, military posts, mail routes, and wagon roads were some of the ways in which the Army Engineers contributed to national growth. The Army rarely questioned publicly the motives of the petitioners, even though honest differences of opinion existed about the constitutionality of providing tax dollars for "internal improvements."

As the debate over the morality of slavery intensified in the late 1820s and 1830s, Southern politicians took up the cause of opposition to such public works projects. If the more populous North gained the majority of federal improvements, it could overtake the South. Such a national hero as President Andrew Jackson balked at encouraging public works, in part because of the political questions they presented, and also because of his fiscal conservatism. The new territories of the Pacific Northwest posed a dilemma to Congress as well. That body wondered how to extend public services to areas yet incapable of funding them independently. The Congress also wanted to encourage rapid growth to hasten the day of statehood in the West while quieting the fears of Northerners that slavery would spread to these regions and provide the South with an artificial majority in the national legislature.[13]

With the development of California stimulated by the Gold Rush of 1849 and statehood in 1850, the West Coast clamored for connection with the East in the most direct fashion. The territories of Oregon, New Mexico and Utah pressed for acceptance of their appeals for statehood, and saw federal expenditures for roads and highways as one means of achieving success. To temper the political debates in Congress, Southwestern leaders approached the Topographical Engineers to serve as their spokesmen in Washington. This relationship strengthened as Congress justified western public works projects on the basis of security and national defense. The impartial judgement of the scientific minds of the Engineers also offered a solution to the political deadlock over the region of the West that would gain approval for a transcontinental railroad route.

The Engineers entered a snakepit of political jealousies and bureaucratic competition when they accepted their mandate from Congress to survey wagon roads and railroad lines in the West. As Secretary of War, Jefferson Davis held the reins of power over the Topographers. As a staunch Southerner he espoused a route through the Southwest that would link California and its booming population to the southern states of the Gulf Coast. Senator Stephen B. Douglas of Illinois wanted to help his home state and the city of Chicago by making it the railhead for a central route through either Kansas or Nebraska. His ownership of property as well as that of his friends along the proposed right of way led him to oppose any efforts to build the railroad through the Southwest.

This heated debate in Congress resulted in passage of the Pacific Survey Act of March 1853. The legislators called upon the Secretary of War to submit a full report within ten months on all practicable routes from the Mississippi River to the Pacific Ocean. Topographers would lead these various parties of soldiers and civilian scientists to compile data on all natural history relevant to the building of the railroad. They followed parallels of longitude in their quest, with two in the southern half of the region: the 35th parallel through Albuquerque and Zuni, and the 32nd parallel through El Paso and Tucson. Of these routes, the former seemed more advantageous from a political perspective, as it started in St. Louis, home of Thomas Hart Benton, and followed the Santa Fe Trail and Arkansas River valley. The final report filed by Army Lieutenant Amiel Weeks Whipple could not deny the topographical advantages that also existed on this route.

When all survey data filtered into the War Department, it became evident that the best natural route followed the 32nd parallel from San Antonio to El Paso, and on to San Diego. Captain John Pope stated in his report the factors of climate, terrain, availability of mineral resources, areas for potential development, and ease of military defense. These combined to guarantee the highest return on any federal investment in a cross-country train route. Nor did Pope break precedent with the Topographers in his support for the southern corridor. William Emory, James Abert, William Marcy, and James Simpson all had spoken favorably of the prospects for travel throughout the deserts of southern New Mexico and Arizona.

Ultimately the Engineers' surveys revealed two problems. Any of the routes could support a railroad, and by 1890 all five primary survey areas had rail service. But the perceived favoritism for the 32nd parallel by the Topographers convinced northern Congressmen and Senators that the War Department followed the dictates of Secretary Davis. Then careful scrutiny of the documentation showed haste in preparation, errors in judgement and the refusal of the Engineers to consider other alternatives to the 32nd parallel. The result, according to Goetzmann, was failure. "The Corps in its professional pride and the Secretary in his sectional prejudice had ignored reality." By adhering to their scientific principles, the Engineers had outlined the most reasoned solution. But as Goetzmann concluded, it was "still the passions of most men that governed their relevance to the cause of national progress."[14]

The decline in official support for the Corps of Topographical Engineers came when Jefferson Davis suggested that that body be disbanded, and its officers returned to the status of military engineers in the Regular Army. In 1854 the Secretary of War created the Office of Western Explorations and Surveys, which assumed all reconnaissance work of the Topographers. The following summer Davis established the Pacific Wagon Road Office in San Francisco,

making it the agency for construction of these routes through the West. Some historians cite these gestures as proof of Davis' dislike for the Engineers and their mishandling of the railroad surveys. Yet others contend that Davis sought a consolidation of military functions in the West to promote a more efficient defense, and to control Indian attacks by protecting those areas of settlement deemed most valuable. Davis had soured on military responses to civilian demands for public improvements, and the limit of 36 Engineer officers left the Topographers overworked and unable to devote proper attention to their military duties.

Even as western political figures scored the Engineers for their performance in the region, they also introduced bills to involve the federal government in other public works, especially wagon roads. The Engineers regained much of their lost influence as Congressmen, Senators, and territorial delegates called upon them for help. The Corps possessed not only the necessary expertise but also a motive [national defense] that compelled Congress to act. Land speculators wanted roads and highways to bring travelers, commerce, and capital to any of a thousand potential metropolises from Kansas City to Sacramento. The Engineers could provide this and more, since they also could bring their own money and their unsurpassed knowledge of the West. These factors helped the Topographers to rise from the ashes of political defeat as quickly as they had fallen with the railroad surveys.

The Engineers had their strongest case for extensive road building in the Territory of New Mexico. They worked closely with such local dignitaries as Miguel Antonio Otero, Senior, the territorial delegate for New Mexico in the 1850s. The governments of Spain and Mexico had neglected improving the transportation and communications network of their northern province due to lack of funds and manpower. Worsening the situation was the migratory pattern of the 17th century settlers from Mexico who selected the river valleys for their sources of water. The rugged mountain and desert terrain worked against any consolidation of government services, and the defenseless villages made easy targets for Indian attacks. This situation prompted retaliatory raids that only exacerbated the problems of New Mexico Indian policy. The first American military officials commented at length on the obstacles to travel for soldiers and settlers, and W. Turrentine Jackson, in his *Wagon Roads West,* stated that General Kearney "had more trouble with the roads [of New Mexico] than [he] did with the Mexicans."[15]

To ameliorate the conditions found by the U.S. Army, citizens of New Mexico Territory placed before Congress no less than 11 petitions for federal road projects. The New Mexicans believed that the government would answer their requests in full. They exhibited no desire to fund these activities on their own, and knew that their impoverished land would spring to life with infusions of federal capital. In 1854 the Engineers received $32,000 to repair roads from Taos to Santa Fe, and from the capital city to El Paso. The manager of these projects, Captain Eliakim P. Scammon, disliked both his transfer from the Great Lakes to the Southwest, and the cultural vacuum he found there. The result was mismanagement of $13,000 in roadbuilding money, with no construction undertaken and with Scammon unable to account for $350 of the funds spent for his personal transportation. Colonel John J. Abert had to dismiss Scammon from the Corps, the only Topographer to suffer that fate. New Mexico had no improvement on its roads, and had to return to Congress in 1855 for more money.

By the late 1850s the Engineers had constructed or improved a total of five roads in New Mexico. Among the obstacles overcome in their work were the location of artesian wells and construction of way stations along the Jornada del Muerto [present-day Interstate Highway 25] in southern New Mexico. The work of the Engineers in the territory connected the most-populous communities, and in the 20th century the routes surveyed and constructed became the corridors for major state and federal highways and transcontinental railroads.[16]

The success of the Topographical wagon road program in New Mexico and elsewhere encouraged many politicians to increase federal spending for these and other public works projects. Whereas Congress preferred to fund such activities for military necessity, by 1857 it had overcome criticism of this practice and embraced the principle of federal projects that benefited all citizens. The Engineers then found themselves rejecting new schemes to attract federal monies as not in keeping with their military mission. Local officials then hastened to other agencies like the Interior Department for help instead. On the pretext that the newly formed Bureau of Indian Affairs could build western roads to maintain its Indian policies, Congress authorized Interior Secretary Jacob Thompson to create the Pacific Wagon Roads Office. The record of this agency was one of waste, corruption and favoritism, as it sponsored politically important but technically marginal projects. The only salvation for the West was the coming of the Civil War, which terminated the Pacific Wagon Roads Office in 1861.

The outbreak of violence at Fort Sumter, South Carolina, in April 1861 did more than plunge the nation into four years of war. It reduced the federal presence in the West and Southwest, and necessitated an entirely different perspective of the region on the part of the government, military, and private concerns. The war also called the Topographical Engineers back to their military tasks of national defense, and led to extinction of their separate status in the larger Army Corps of Engineers. When the nation again directed its attention westward, the agent of change would be private enterprise, abetted by generous federal subsidies. These consisted of grants for railroads and mail delivery, and land grants under the Homestead Act. The U.S. Army Corps of Engineers no longer held sway as the primary force in promoting settlement in the West. Yet there was a place for the Engineer officer in the first decade after the southern surrender at Appomattox.

Upon conclusion of the Civil War, the Army Engineers returned to the West to conduct new surveys and reconnaissances, only to find the dynamics of western life different from before. The Engineers faced stiff competition from private individuals, academicians, and scholarly foundations in their scientific endeavors. No one challenged the Engineer's prerogative in fortifications and defense, and many communities in the midst of Indian lands hailed the Corps for their assistance. Local developers and boosters pursued the time-honored tradition of federal contracts that meant goods and services for the military, and prosperity for civilians.

Assisting these communities were an increasing number of federal agencies that convinced the postwar Congress to appropriate funds for additional studies of railroad routes and public works projects. In the 1870s the major military and engineering endeavor was the series of surveys conducted by Lieutenant George M. Wheeler in the Colorado River valley, the Four Corners area of the Colorado Plateau, and the mountains and deserts of southern Colorado and northern New Mexico. On a later journey in 1875-1876, Wheeler and his party traveled from

Pueblo through La Veta Pass in the Sangre de Cristos, and down the San Luis Valley to Taos. From there they headed west across the Rio Chama to Canon de Chelly, and returned to Santa Fe along Simpson's route through ZuniPueblo, Chaco Canyon, and Mount Taylor.[17]

Lieutenant Wheeler took with him as "chief journalist" William H. Rideing, a reporter for the *New York Times*. His commentary touched upon many areas that would later become part of the Albuquerque District in the 20th century. Rideing's first impression of the region was that the northern Rio Grande valley "made the barrenest of our Eastern states appear gardens in comparison." But the New York City native gradually came under the same spell as had other officers and chroniclers of Engineer expeditions in the Southwest. Along the Rio Conejos Rideing saw Hispanic farmers plowing their fields with "iron-shod forked sticks," while the women carried "earthen vessels of water on their heads in the same manner that Rebecca did in the time of the patriarchs." Rideing labeled the Navajos of western New Mexico "a peaceable tribe, a good-looking tribe, and an honest tribe as Indians go." Navajo women, he said had "flashing black eyes," and their laughter was "low and musical and tender."[18]

At the completion of their circuit through the Southwest, the Wheeler Survey entered Santa Fe, site of many reconnaissances for the Army Engineers in the past. The age of the town struck Rideing and the others, as did its exotic aura and its wickedness. Women sat on porches along narrow streets, rolling cigarettes and cursing the traffic as it passed. The Palace of the Governors, seat of New Mexico territorial government, entertained "quite an active throng" of "fashionable dressed civilians, military officers in blue and gold, rough-looking soldiers, weather beaten emigrants and broad-hatted teamsters." Rideing recoiled in disgust at the "completely amoral attitude" of Santa Fe's best citizens, whom the chief journalist described as gambling and carousing with "unfortunate women, and thinking nothing of it."[19]

The Wheeler travels witnessed the last major Army engineering work in the Southwest until the studies of western river valleys in the late 1920s. Civilian scientists wanted no Army interference or competition with their work, and the emergence of such national figures as Ferdinand V. Hayden and John Wesley Powell attracted public attention for their surveys in the mountain West. The Army also lost the support of the White House in 1877 when Ulysses S. Grant stepped down as President. The decade of the 1870s had seen much experimentation in the fields of science and engineering, but the pressures on Congress to delete funding for military studies were overpowering. When Lieutenant Wheeler met the Hayden Survey in the Twin Lakes area near Leadville, Colorado, in the summer of 1873, with both the Army and Interior Department financing separate studies of the same region, newspapers delighted in the spectacle of competing agencies measuring the topography side by side. The Congress saw little humor in this circumstance, and by 1879 ended all funding for Engineer activities in the Southwest.

Given the nature of American popular culture and mythology, it is understandable why the activities of the Army Engineers in the Southwest drew little attention from novelists, historians, and filmmakers of the 20th century. The work of the Topographers required intelligence, sophistication, and advanced training, as well as the rugged qualities more often associated with the fur trappers, miners and cowboys of the Golden West. But ignoring their contributions obscures much of the real history of the 19th century Southwest. The sparse rainfall, lack of population, distance from major urban centers, diverse cultures,

and political intrigue all affected the work of anyone coming to the region. These factors would not disappear, and would present major challenges to the Topographers' modern-day successors, the Albuquerque District.

II

CREATION OF AN ENGINEER DISTRICT AT CONCHAS DAM

When the last member of the Wheeler Survey departed Santa Fe in 1875, little did the Army Engineers realize that they would not return to the Southwest for another half century. The labors of Wheeler, Emory, Simpson, and others had served to identify and explain the geographic and climatic uniqueness of the arid regions of New Mexico and west Texas. The 20th century exploits of Captain Hans T. Kramer and his colleagues at Conchas Dam established the Engineers as a permanent fixture in the Southwest. They would bring employment opportunities, technological expertise, and promises of a better life for New Mexicans. The work performed at Conchas Dam in the 1930s ushered in a new era in the history of the region, and its effects on urban growth, irrigated farming, and large federal investment in civilian and military projects are only now becoming evident.

The intervening years between the 1870s and the 1930s brought much change to the political, economic, and social landscape of New Mexico and also to the Army Engineers. Because New Mexico had failed to achieve self-government in its many attempts at statehood after 1848, the region endured the status of territorialism. Outside influences, both public and private, controlled the life of its citizens. A group of businessmen, lawyers, and politicians known as the "Santa Fe Ring" emerged, with its primary goal the acquisition of land, resources, and political power through dominance of the federal and territorial offices in New Mexico.

This condition promoted a sense of "colonialism" in New Mexico. The territory enriched interests among corporations and investors. Dependence upon the largesse of these organizations and a need for federal financial aid hindered delivery of the necessary public services in the territory. This situation created in New Mexico an almost-permanent state of economic weakness. The territory came to be known in the halls of Congress as a backwater; an area with not enough English-speaking citizens for the national legislature to entrust with the autonomy of statehood. The result was internecine political warfare, as the few choice positions of power devolved upon those with the strongest political machines and local support. In an national era known for its excesses and corruption, the territory of New Mexico suffered more than its share of scoundrels, and learned to practice the techniques of its most successful exploiters.[1]

The factors that restricted the growth of New Mexico in the latter half of the 19th century also explain why the Army Engineers heard no call from local officials and promoters to assist in the development of the region. The Santa Fe Ring did not wish to have an independent agency of the federal government offering them scientific and technological support as they set about the task of amassing fortunes and encouraging settlements. The criticism of the Corps in earlier years had been its adherence to its own high standards of professionalism, which conflicted with the individualism of the Gilded Age in the

West. The primary concerns of New Mexico's leaders were building railroads, establishing mining and timber industries, and dominating the cattle business. Thus the shapers of New Mexican economic life kept their own counsel on matters of public works and outside interference.

Despite the harrowing conditions of life in New Mexico during these years, the inexorable process of change came when the railroads brought a number of eastern migrants determined to establish homes and families in the territory. This growth forced the Santa Fe Ring to decline after 1900, as the nation took on a spirit of reform known as Progressivism. While generally considered an eastern phenomena, the Progressive movement reached out into New Mexico in the person of Miguel A. Otero, Junior, territorial governor from 1897-1906 and son of the former territorial delegate. As the only Hispanic governor during the nearly seven decades of territorialism, the Notre-Dame educated Otero and his eastern advisors utilized many of the tactics of the Progressives to begin the process of modernization that would eclipse the power of the Santa Fe Ring and deliver statehood to New Mexico by 1912. Among these efforts were many appeals to Congress for federal funds to construct schools, hospitals, and other services to improve the economic and social circumstances of New Mexicans. Otero also established precedent with an application to the Interior Department to construct a massive irrigation project in the southern portion of the territory at Elephant Butte.

The signature of President William Howard Taft on the enabling act of 1912 granting statehood to New Mexico did not alleviate her problems of poverty, isolation, and the presence of large numbers of Hispanic and Indian citizens unfamiliar with the workings of American government. The new state retained many vestiges of its territorial colonialism. These included dependence upon outside sources of income, specifically tourism, mineral extraction, and federal spending. A generation of disaffected easterners ventured to Taos and Santa Fe during the 1920s to escape the crassness of American materialism, and found the quiet, the poverty, and slower pace of life a welcome relief from the Babbits, Al Capones, and Babe Ruths of the rest of the country. New Mexico became duly famous as a haven for artists, literary expatriates, and their wealthy camp-followers. All of this attention highlighted the state as a place of remarkable beauty and charm, but added little to its economic vitality.[2]

By 1929 the prosperity of the Roaring Twenties had failed to "trickle down," in the words of U.S. Treasury Secretary Andrew Mellon, to the average citizen of New Mexico. The state had no factories, mills, populations centers, or professional classes to assist in the transformation from a rural to an urban society. Flapper girls and tuxedoed gents gathered in isolated clusters at the Kimo Theatre in Albuquerque or the La Fonda hotel in Santa Fe. But the "Jazz Age" made hardly a dent in the lives of the other cultures of New Mexico. Government statistics collected at the height of the Depression found 50 percent unemployment in the state and less than one percent of its irrigable lands under cultivation. Those citizens fortunate enough to find work were besieged with requests for food and financial aid from their fellow residents.[3]

Into the midst of this political and economic struggle came the Memphis District of the U.S. Army Corps of Engineers, predecessors of the Albuquerque District. In much the same way as the 19th century Topographers, the Corps brought a knowledge of science and technology to an area lacking in both. They also had a desire to serve the cause of national growth and expansion. The mission of the Topographers had been advisory in nature, whereas the Corps of the

1930s came equipped with Congressional mandates to provide nationwide flood protection on navigable rivers and streams. As had New Mexico and the nation, the Corps had undergone a metamorphosis in the intervening years since the 1870s, building upon its acquired skills by adapting new techniques of engineering and science. The Progressive Era which loosened the grip of colonialism on New Mexico also brought to the study of engineering a sense of professional competence and purpose, as more schools trained graduates to take its places in the expanding industrial world of the 20th century.

With a new spirit of professionalism came the rise of the social engineer. This manager of people and resources would take the long view of national development and apply the neutral judgments of science to a world of political and economic uncertainty. Society took comfort in the knowledge that Frederick W. Taylor's "scientific management" principles, Henry Ford's assembly line and such innovations as the city manager form of municipal government had united the talents of Yankee ingenuity with American business to ensure prosperity for all. When Herbert Hoover, a graduate of Stanford University and a mining engineer, took office as President in 1929, newspapers hailed the arrival in Washington of the "Great Engineer" who would find answers to the age-old questions of poverty and economic deprivation.[4]

Although the general public came to accept the role of the engineer in its daily existence, the West did not embrace the Corps so readily. The first federal agency to enter the field of water resource management in the Southwest was the U.S. Reclamation Service, created by Congress in 1902 to fulfill the obligations of the Newlands Act. Renamed the Bureau of Reclamation in 1923, this branch of the Interior Department served as a means of funding and construction of small-to-medium scale water projects throughout the West. By bringing irrigation water to arid lands, the Bureau enabled single-family farming to flourish, enhanced the tax base of western states, and delivered on a Progressive promise to mitigate the harshness of urban life. New Mexico received several of these projects, including McMillan and Avalon Dams on the Pecos River, and Elephant Butte Dam on the mainstem of the Rio Grande.[5]

With the preeminence of the Bureau of Reclamation in western waters, the Corps of Engineers had little reason to concern itself with New Mexican affairs. Since 1879 the Corps had acted under Congressional direction to provide flood protection. The small populations and lack of navigable streams in the West led the Army Engineers to devote attention to its work along the Mississippi River and the East Coast. Corps policies centered around channelization as the best means of flood control, and the Corps viewed as problematic the construction of large reservoirs such as Reclamation's pools. By the 1920s these experiences had not prepared the Corps for the circumstances that gave rise to Conchas Dam: the obstacles of land acquisition, hiring workers, building a flood control reservoir, and understanding the complexity of political life in New Mexico.[6]

The U.S. Congress had authorized the Army Engineers to prepare cost estimates for surveys of river basins nationwide in search of power development projects, flood control, and irrigation works. The Corps also would target potential electricity purchasers and their markets, and suggest comprehensive plans for utilization of basin-wide programs. Known as the "308" reports because of the number of the House document in which the survey cost estimates appeared, the subsequent studies included 24 separate river basins from Maine to Hawaii. Congress had restricted the Corps from focusing on the Colorado River, because of plans designed for it by Representative Carl Hayden of Arizona and the Bu-

reau of Reclamation. Thus the Southwest offered the Corps few incentives for study, and the Rio Grande, Pecos and Arkansas Rivers received no funds or authorizations.[7]

When political leaders of the state of New Mexico learned of the omission of their streams from the Corps' "308" work, the state legislature appropriated $30,000 to conduct its own survey of flood control and irrigation work on the Canadian River near Tucumcari. Local residents and public officials matched that amount with contributions, giving the state engineer a total of $60,000 with which to plan future water projects. Although flood protection headed the list of subjects under consideration, the "Report on the Canadian River Investigation" in 1929 also encouraged construction of reservoirs for irrigation. The state engineer recommended projects at Dripping Springs on the Canadian, and at Gallegos on Ute Creek, a tributary of the mainstem. The study also mentioned a site where the Rio Conchas entered the Canadian upstream from Dripping Springs, but rejected it because the Conchas location would require more funding and provide control of a lesser percentage of the drainage area of the Canadian River.

Upon receipt of the state engineer's report, the New Mexico delegation in Congress petitioned the Army Engineers to conduct its own investigation. This request became part of the Flood Control Act of 1929, with the Corps responsible for location of domestic water supplies, irrigation, and hydroelectric power sources. Referring frequently to the New Mexico report on the Canadian, the Engineers concluded that construction of the two proposed water projects meant an outlay of $11.4 million, including maintenance costs. The seasonal stream flow precluded any value for navigation or hydropower. The city of Tucumcari could not afford the cost of sharing construction of a municipal water supply, and the benefits derived from irrigation storage would not repay the expense incurred by a conservancy district. The only sites on the Canadian threatened by flooding were bridges belonging to the Southern Pacific Railroad, which that company repaired as part of its maintenance procedures. The Corps estimated that the property thus protected by the Dripping Springs and Gallegos project would amount to only four percent of the initial cost, leading each level of Corps management to recommend no further action.[8]

The unanimous rejection of the Canadian survey request disheartened New Mexico officials, who tried with little success to revive interest in the scheme for the next three years. The area surrounding the Canadian basin had relied heavily on dry farming techniques. The steady decline in rainfall amounts throughout the 1930s made this type of farming unproductive. The Bureau of Reclamation, through difficulties with its revolving credit fund, could not assume the burden of construction on the Canadian. The combination of New Mexico's perennial poverty and the spreading malaise of the Depression left the state government with few alternatives. The Hoover administration preferred private enterprise to build and maintain public utilities and public works. Yet Hoover's appeals to voluntarism and private charity appeared incapable of fashioning solutions to the nationwide economic emergency.[9]

As Dust Bowl migrants from the Southwest drifted through New Mexico on their way to the fields of California, local farmers looked eastward to the hopes stirred by Franklin D. Roosevelt and his promise of a "New Deal" for the beleaguered nation. Elected in 1932 on a platform of recovery and balanced budgets, Roosevelt came to the White House with the country at its lowest ebb. Banks closed their doors at the rate of 200 per week by March 1933, nearly one-

third of all eligible adult workers had no jobs, and the prosperity witnessed by Herbert Hoover in 1929 had vanished. To correct this situation, Roosevelt called Congress into special session on his first day in office, and overwhelmed the legislators with correctives for the nation's ills.

The state of New Mexico was slow to profit from the largesse of the "First Hundred Days" of Congressional activity. The early phases of the New Deal focused on midwestern farmers and northeastern cities. The National Industrial Recovery Act provided for increased productivity and hiring by business, while the Agricultural Adjustment Act offered price supports and payments to restrict crop and livestock production. Because New Mexico had no urban centers over 30,000 in population, and few of its farmers ventured beyond local markets, the state had to content itself with the early welfare programs of 1933.[10]

The fortunes of New Mexico changed, especially those of the Canadian River survey, with the rise of a new national attitude towards public works projects in the West. The Roosevelt administration detected a need for larger federal outlays to hire the unemployed at meaningful tasks and living wages. As part of this new approach Congress asked the Army Engineers in late 1933 to reassess the economic merits of many water projects tabled during the Hoover years. On 3 October the Division Engineer for the Lower Mississippi Valley Division completed the "Report on Unemployment and Destitution in Certain Sections of Texas, Oklahoma, Kansas, Colorado, and New Mexico." The Corps reiterated the findings of its 1930 surveys, but did suggest that the cost-benefit ratio of a dam on the Canadian River could be improved if relief work payments became a factor in the equation.[11]

The Chief Engineer included this new study in his request to the National Emergency Council on 17 May 1935. The Corps agreed to the juncture of the Conchas and Canadian Rivers as the site for a water project, and believed that the most fruitful source of funds would be the pending legislation known as the Emergency Relief Appropriation bill. In January 1935, Roosevelt had proposed hiring 3.5 million jobless individuals and paying them wages above the minimum standard of 25 cents per hour. This would give the unemployed more purchasing power without undermining incentives for private industry. The bill also sought to provide workers with marketable skills, so as to avoid the ignominy of "make-work" projects and to remove the government from the business of relief. The Corps requested $4.5 million for its Canadian River project, theorizing that 2,500 laborers could be hired from the Tucumcari environs, and that the work at Conchas Dam would have a salubrious effect on other businesses as well.[12]

The New Mexico Congressional delegation fell into line behind the Conchas project, as did prominent state and local officials. U.S. Senator Carl A. Hatch praised the relief bill as crucial to the economic health of the state. The *Albuquerque Journal* remarked that after two years of the New Deal the state could afford only a 3.4 percent contribution to match federal relief monies. Often the legislature could not generate sufficient funds to aid its own citizens, and the *Journal* conceded that "we are near the top of the list of percentages of money provided by the government." Governor Clyde Tingley quickly appointed a Canadian River Commission to negotiate with the federal government for the Conchas project, and selected as its members James L. Briscoe, H. B. Jones, and Arch N. Hurley, all prominent Tucumcari businessmen.[13]

As the appropriations bill worked its way through Congress, the New Mexico officials left no stone unturned in their search for support for Conchas

Dam. The city fathers of Amarillo, Texas, some 180 miles downstream from the proposed site, formed their own fundraising committee and journeyed to Washington in the spring of 1935 to lobby Congress. U.S. Representative Tom Connally of Texas worked alongside New Mexico Senators Carl Hatch and the newly appointed Dennis Chavez to convince Harry Hopkins of the Progress Division of the Works Progress Administration [WPA] to support funding for the dam. Amarillo hoped for flood control, an increased supply of municipal water, and employment of its own workers as part of the labor force.[14]

In the enthusiasm displayed by the political and business leaders for authorization of Conchas Dam, they downplayed two important obstacles to their success. The state of New Mexico had no money to offer as its share of the cost of the project, and the legislature would not meet again for another seven to eight months. In addition, Harold L. Ickes, director of the Public Works Administration [PWA], expressed doubts about the efficacy of any water project on the Canadian River in New Mexico. As both PWA chief and secretary of the Interior, Ickes wielded much power in matters of unemployment relief and western public works. Although he professed a desire to further the lives of small farmers, Ickes also feared that profligate public officials would abuse the federal purse in their haste to attract water and power projects. Ickes' skepticism caused him to move deliberately on federal spending at a time when boldness and action satisfied the public, and the New Mexico officials worried that his opposition to Conchas would seal its doom.

In order to circumvent the recalcitrance of Ickes, New Mexico adopted a series of tactics and options for Congress to consider. In September 1934, Arch Hurley informed New Mexico Governor A. W. Hockenhull that the state should compromise with Ickes on the Conchas matter. New Mexico would offer as a substitute the Pajarito damsite on a tributary of the Canadian. This would cost less than $1 million, would employ local workers, and would demonstrate to the PWA director the need for the entire Conchas proposal. The governor endorsed Hurley's approach, and believed that the prevailing drought would convince Congress to overlook the negative opinion held by Ickes.[15]

The spirits of the Tucumcari boosters heightened with the election in November 1934 of Clyde Tingley as governor of New Mexico. An outspoken New Deal Democrat and mayor of Albuquerque, Tingley embraced the Conchas project as the type of endeavor sorely needed throughout the state. The governor pledged support to Arch Hurley and his associates, and volunteered to approach the state legislature with whatever request for funds they recommended. This gesture came to haunt the dam's enthusiasts, however, when the War Department announced in May that the Conchas work required $8,691,000, of which $4.5 million could be allocated for the first two years. In return the state had to purchase all necessary rights of way. Arch Hurley wrote an urgent message to Tingley revealing his doubts. "We are stuck," said the longtime project supporter, unless the Red River Valley Corporation, owners of the property upon which the Conchas site existed, accepted promises of deferred payment for their lands. "We need $54,000," said Hurley, "about as bad as I have ever seen in my life," and the state required the money at once "in order to grab this thing while it is hot."[16]

As New Mexico fought the battles of funding and PWA opposition in the summer of 1935, it gained a new enemy in eastern Congressmen who disliked the irrigation aspects of Conchas. Federal policies of crop reduction fostered by the Agricultural Adjustment Act conflicted with New Mexico's desire to bring

another water project on line. Then the issue of relief work surfaced, as Harry Hopkins informed New Mexico that the WPA would not support employee salaries beyond a per capita limit of $1,100 per year. Full time laborers could earn no more than $90 in any one month, less government deductions for taxes and housing costs. New Mexico's northern neighbor, Colorado, in contemplating water projects of its own, declared that "works relief administrators are set against any modification to meet the problems of the western states." Repeated messages between Santa Fe and Washington brought about an agreement in July that major public works projects would not be charged against the work quotas for states. This left Congressional approval as the final hurdle for Conchas Dam.[17]

The date of 23 July 1935, marked a milestone of sorts in New Mexico history, as the PWA Allotment Board recommended to Congress and the President that Conchas be built. Tingley, Hurley and others hastened to Washington for final negotiations on the project, which culminated with the signing of the Emergency Relief Act by the President on 1 August. The city of Tucumcari celebrated with sirens, horns, bands playing, and an estimated 4,000 people shouting in the streets. The city fathers welcomed back Arch Hurley as a conquering hero, escorting him through town to a public rally, where he received an engraved watch for his efforts. The council memorialized all the participants in the struggle, and prepared for the new day of prosperity and wealth.[18]

With the guarantee of funds for construction of Conchas Dam, civic and political officials then realized that many small details which they had overlooked now cried out for attention. Hurley traveled to New Haven, Connecticut, to meet with Julius G. Day, president of the Red River Valley Corporation, owner of the Bell Ranch. Hurley wanted Day to offer to sell the damsite and necessary rights of way, but could not produce official credentials authorizing him as a bargaining agent for either the state of New Mexico or the Army Engineers. Hurley returned to the Southwest and publicly informed all concerned that the resistance of the Bell Ranch was a minor obstacle, and that the governor would permit construction to begin by executive order.[19]

The manager of the ranch, Albert K. Mitchell, observed the frenetic activity around Tucumcari with increasing alarm. Governor Tingley had conducted an elaborate scheme to acquire federal funds by speaking on behalf of the state legislature and the ranch without the knowledge of either. Mitchell learned that Tingley had informed Washington that New Mexico would purchase all rights of way. The governor then attempted to convince the Bell Ranch to accept a 90-day note without payment as good faith on the part of the State. When Captain Hans T. Kramer, District Engineer for the Tucumcari District, discovered that Tingley had no money with which to secure the land, he threatened to remove all federal support and assign the funds to other projects. "The governor is in quite a jamb [sic]," noted Mitchell, "and [he] appreciates it."[20]

The opposition of the Bell Ranch to construction of Conchas Dam created friction among all parties concerned. Mitchell agreed to continued core drilling by the Engineers to determine the exact location for the dam, but prohibited the erection of permanent structures for housing the relief workers. Kramer replied that his operations schedule stood in jeopardy, and the captain and Governor Tingley suggested that the state could file condemnation proceedings on the property in question. Ranch officials remained firm in their beliefs, and on 10 August the state brought suit in district court in Las Vegas, New Mexico, for 1,100 acres of Bell Ranch land to comprise the townsite, road easements, and

the dam itself. The court hired real estate appraisers to begin an immediate survey, and upon conclusion the District hoped to enter the Bell Ranch and commence work.[21]

Lawyers for the ranch soon realized the dilemma facing the Red River Valley Corporation. The state had no legal authority to initiate condemnation proceedings, since previous negotiations had not produced a deadlock. But the sentiment of the region surrounding the proposed damsite was, in the words of the ranch manager, "aroused to a fever heat" over the thought of employment. Local newspapers castigated the ranch for its large size [some 40 square miles], its absentee ownership, and its prosperity amidst the depressed conditions of eastern New Mexico. J. O. Seth and Charles M. Botts, attorneys employed by the ranch, feared that Judge Luis Armijo of Las Vegas, the jurist assigned to the case, would be influenced by his connections to the Clyde Tingley and Dennis Chavez political machines. Yet the ranch had no choice but to fight, for as Albert Mitchell stated: "It would have been to our advantage . . . to have tried to get the whole adjustment made at one time. The unfortunate feature is that they [the state] have no money."[22]

To alleviate the fears of the Bell Ranch about Judge Armijo, the state attorney general and the Interstate Stream Commission moved to disqualify the Las Vegas official. In his place the Court appointed Fred R. Wilson of Albuquerque to handle the litigation. The court rejected a motion by the ranch to dismiss the case on the grounds of New Mexico's lack of funds, and ordered the appraisers to bring in their report as soon as possible. The ranch then appealed to the New Mexico State Supreme Court to halt the survey work, arguing that the Interstate Stream Commission had no authority to negotiate with the Bell Ranch. The Red River Valley Corporation presented its legal points effectively, but could not convince the court of its merits. "We are in no wise to blame for our present position," said Red River board member Louis Stoddard. "They [state officials] have muddled the thing frightfully," and "just because they have made fools of themselves is not sufficient excuse . . . to act like idiots ourselves."[23]

Despite the court suits filed by the state, Arch Hurley knew that Conchas Dam might lose. He then secretly approached Stoddard with a plan to win support for the land sale. Hurley suggested that the ranch apply pressure on the Army Engineers to provide free water rights to 3,000 acres on a high mesa above the reservoir, and also supply free electricity to pump the irrigation water. In return the ranch would sell the state 17,000 acres it owned on the canyon floor. The actions of Hurley offered the ranch an alternative that they cynically chose to pursue. Stoddard wrote to Albert Mitchell, saying that "the time is past when we should spend our time ridiculing the proposed development and get down to brass tacks." The construction activity would adversely affect ranching and farming for the next several years. But Stoddard concluded: "I hope we are going to be paid a sufficient sum to at least act as a balm to our wounded exchequer."[24]

While Arch Hurley attempted his resolutions of the Bell Ranch case, New Mexico's politicians moved to raise funds in a variety of ways to purchase the site. Carl Hatch inquired of the PWA and the Federal Emergency Relief Administration about monies for the Conchas rights of way, only to be told that "local interests" should meet that need. Governor Tingley then saturated the area with appeals to bankers, businessmen, and farmers to pledge subscriptions to the "Conchas Dam Fund," with Tingley as trustee. Their goal was to raise $100,000, even though the Tucumcari District considered $234,000 a more ap-

propriate figure to offer the Bell Ranch for its lands. Tingley wired General Edward Markham, Chief of Engineers, to seek partial funding from the Corps' own budget, while Harry Hopkins of the WPA engaged in a lively debate with Harold Ickes over the matter of Conchas.[25]

The Ickes-Hopkins dispute on financing the New Mexico water project revealed something more fundamental than bureaucratic infighting over public works. No flood control project contained in the Emergency Relief Appropriations Act of 1935 required federal purchase of rights of way except Conchas. Long suspicious of the methods and motives of New Mexico's politicians, especially Tingley and Chavez, Ickes had always faulted Conchas on grounds of cost-effectiveness. The Interior secretary knew that the state lacked the money to uphold its share of the bargain, and he confided privately to the Bell Ranch owners that he had deliberately released the Conchas funds early to force New Mexico's hand. When Tingley and others could not deliver on their promises, Ickes would then withdraw federal support and expose the ineptitude of the project's sponsors.[26]

Ickes' opposition notwithstanding, Governor Tingley merely increased his hurried pace to attract monies for Conchas Dam. He collected $35,000 from small contributors located from Las Vegas to Tucumcari to Amarillo. He then learned in early October that the District had established the 22nd of that month as their day of departure without Conchas rights of way. Then some of Tingley's corporate sponsors began to lose faith in the project when they learned that no private concessions would be allowed at the construction site. In addition, the low wage scales would preclude any increased commercial activity in the surrounding area. The Bell Ranch would not specify the exact dollar figure that it wanted, preferring to keep Tingley "in the hole," as C. M. Botts put it, and the governor found himself out of options.[27]

With the fortunes of Conchas Dam at such a low ebb, Tingley decided on a bold stroke. He boarded a train in Albuquerque in late September and journeyed to the site of Boulder Canyon Dam on the Colorado River. The Bureau of Reclamation had just completed this massive irrigation and hydroelectric power project 100 miles north of Kingman, Arizona, and had invited President Roosevelt to come west for the dedication. Tingley had cultivated a friendship with Roosevelt when the president spent time at the hot springs in southern New Mexico for his paralysis. The two men met in Roosevelt's railroad car on 1 October. After a conference of more than one hour Tingley emerged with Roosevelt's support for federal purchase of the Conchas rights of way. The President had wired Frank C. Walker, director of the National Emergency Council, about the agreement, including the proviso that the state legislature would repurchase the lands when it convened the following January. This arrangement went against Roosevelt's preference for local support of public works, and thus he warned Walker to keep the matter confidential.[28]

The governor's last-minute appeal had met with success, but the project still faced some more hurdles. Roosevelt wished to see more public interest with subscriptions, and Tingley had to approach his sources for yet another round of pledges. The Army Engineers reminded him of their 22 October departure, and Arch Hurley did not help matters when he boasted to Amarillo's business leaders of the Roosevelt-Tingley compromise. This prompted city officials to inquire about the New Mexico governor's continued fundraising, which forced Tingley to press the federal government for a decision. In a telephone conversation with Lyle Alverson, solicitor for the National Emergency Council, Tingley revealed



Plate No. 3. High Plains Dust Storm at Conchas Dam, 1937



Plate No. 4. N. M. Governor John E. Miles, Cpt. Kramer and Albert K. Mitchell, Mgr. Bell Ranch



Plate No. 5. Surveyors' Tents at Bell Ranch Near Conchas Damsite, 1935



Plate No. 6. Catholic Church at Conchas Dam, 1937



Plate No. 7. Adobe Housing at Conchas Dam, 1939

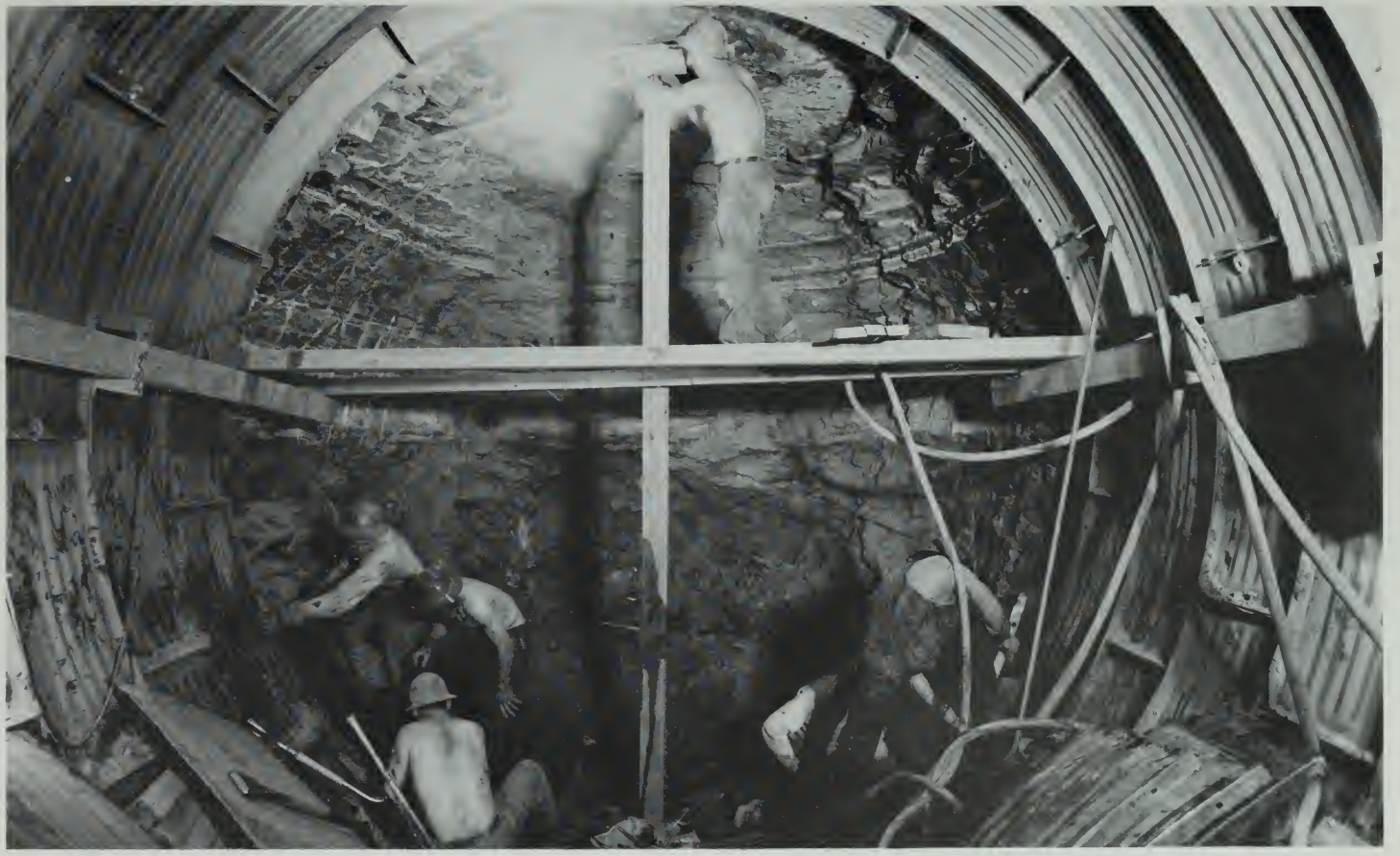


Plate No. 8. Workmen in Irrigation Headquarters Pressure Tunnel Conchas Dam, 1939



Plate No. 9. Governor Clyde Tingley and Captain Kramer, 1938

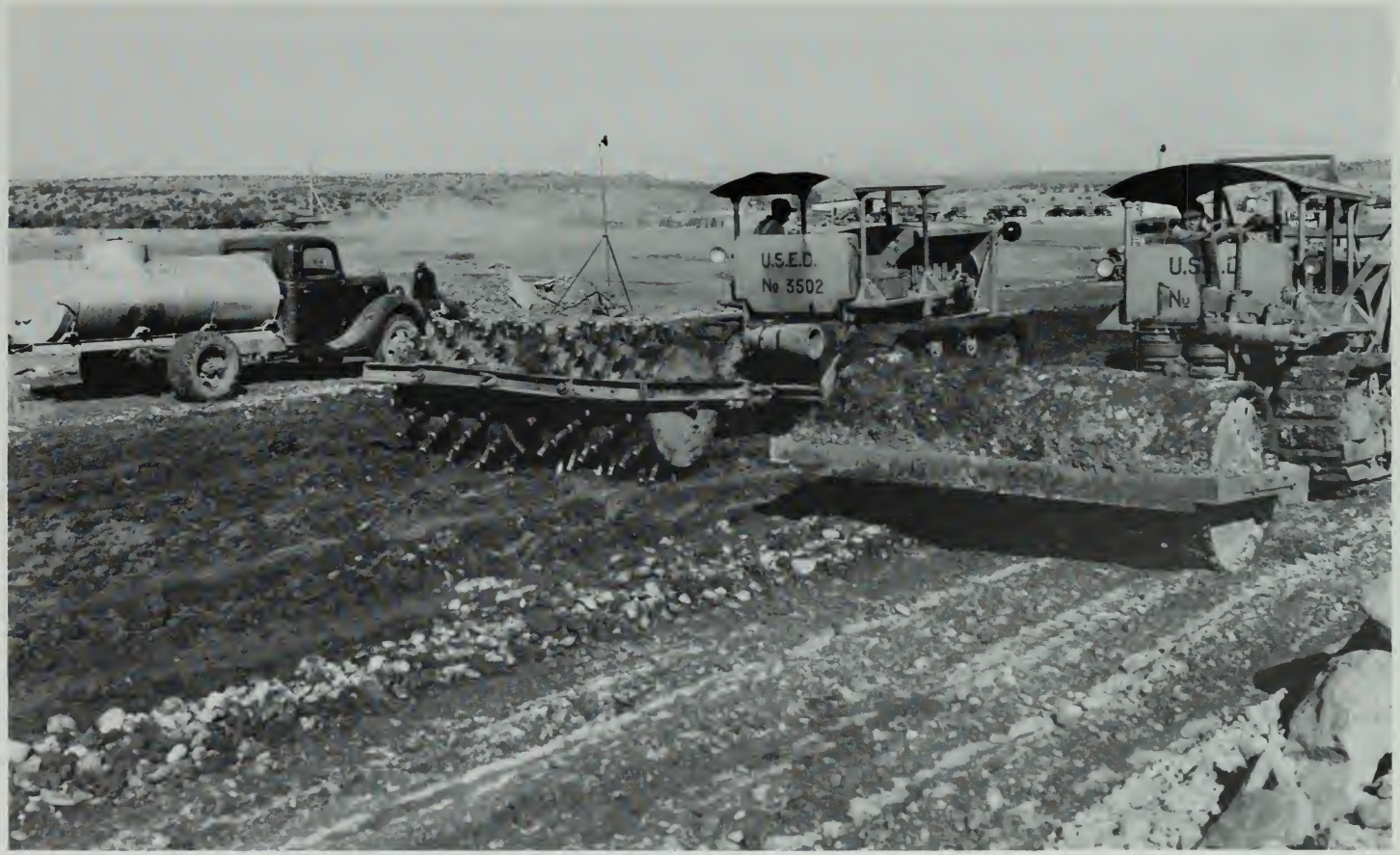


Plate No. 10. Compacting Equipment at Conchas Dam, 1937



Plate No. 11. Dump Truck at South Dike, 1938



Plate No. 12. Spectators Viewing Placing First Concrete in Main Dam, 1937



Plate No. 13. Welding Pipe for Gas Line, 1936



Plate No. 14. Farewell Party for Cpt. and Mrs. Hans Kramer, 1939

the strain that he had undergone over the past several months. He admitted that any appeals by the Bell Ranch to federal courts would be successful, and that he could raise no more money. "I will put up some of the money . . . out of my own pocket," he confided, because "I don't want this job to go by for many, many reasons." The attorney sympathized with the governor, but remained unmoved by Tingley's plea. "When we get the land," said Alverson, "[you] will get the money."[29]

As Governor Tingley's search for answers to the Conchas fundraising dilemma continued, the owners of the Bell Ranch decided to extend to the federal government an offer of their land. Believing that Arch Hurley spoke for the state when he had suggested the trade of irrigation water and electricity for a damsite, the ranch contacted the National Emergency Council on 6 September. Bell Ranch lawyers informed Director Walker that if the Army Engineers bore the $35,000 cost of the Mesa Rica irrigation scheme, the ranch would sell the acreage desired by the Corps. Walker informed Tingley of this gesture, and noted that the federal government took a dim view of the water and power transfer idea. Tingley expressed shock and amazement, telling Walker that "neither [former] Governor [Arthur T.] Hannett, attorney for the Interstate Stream Commission, or the writer of this letter [Tingley], ever agreed with Mr. Stoddard's company on anything."[30]

This latest flareup threatened the project yet again, as the state prepared to claim the damsite as a result of the appraiser's survey in the district court suit over condemnation. Then New Mexico decided to increase the acreage to 34,000 acres, which would include a lake and a public park for recreation. The Bell Ranch threatened another countersuit, this time on the illegality of the entire Conchas affair. "This is not in reality a flood control project," said Louis Stoddard, "and is the taking of property without due process of law." This latest move reached District officials in the field, and led the Chief of Engineers to issue an ultimatum for solution of the problem by 12 November 1935.[31]

This latest contention nearly erupted when the Red River Valley Corporation surprised all parties on 1 November by extending to the federal government another offer to convey title to the Conchas lands. Gone were the demands for irrigable acreage and free electricity. The ranch issued a general statement about "requisite water and appurtenant rights" from the completed reservoir conducted by means of a four-inch pipeline. The ranch set the purchase price at $165,000, and relinquished claims to all acreage under the dam, reservoir, and caretakers' grounds. The ranch considered their offer quite generous, an attitude no doubt influenced by the decision officially announced in the New Mexico Supreme Court three days later rejecting their appeal with prejudice.[32]

Upon receiving word of the Bell Ranch offer, Governor Tingley wrote to George H. Dern, Secretary of War, proposing to reimburse the Army Engineers for their purchase of the Conchas rights of way. General G. B. Pillsbury, Acting Chief of Engineers, told the governor that the War Department would forward the sum of $165,000 to the appropriate state agency once the U.S. Attorney General certified a clear title to the land. The governor, Interstate Stream Commissioners, and the Bell Ranch signed the agreement on 13 November 1935, and Albert Mitchell granted permission to Captain Kramer to enter all the lands designated as the Conchas damsite.

There would be several alterations in this arrangement over the course of the next few years, as the wheels of state and federal bureaucracy turned slowly. These delays disturbed the Bell Ranch and made its managers wonder

about the wisdom of their participation in the project. Yet at no time did the work stand in jeopardy as it had during the summer and fall of 1935. The Army Engineers had their authorization, their funds, and now their field of operations. Next would come the equally challenging task of building Conchas Dam.[33]

For the Tucumcari Engineer District, the work at Conchas helped erase the memories of the legal and financial battles between the ranch, the state, and the federal government. Employment of several thousand workers, both skilled and unskilled, tried the patience of the District Engineer Captain as did the logistics of constructing such a large project miles from any center of population. But the struggles of 1935 were not lost on the Office of the Chief of Engineers [OCE], who along with Arizona Senator Carl Hayden fashioned the omnibus Flood Control Act of 1936. In that legislation the Congress allocated the remaining funds for Conchas, bringing the total to $12,260,000. For the first time the nation had a nationally oriented flood control policy, and the experiences at Conchas figured prominently in its language. "Federal funds appropriated for the execution of the projects," said Congress, "may not be applied to the cost of lands, easements and rights of way." Senator Hayden hoped that future Engineer work would not suffer as had Conchas at the hands of harried politicians, and made certain of that with his explicit phrasing.[34]

The announcement on 1 August 1935 that Congress had appropriated the first two years' worth of monies for Conchas Dam had excited residents of the Tucumcari area. It also set in motion the planning of the Army Engineers to create a district where none had been before. Lieutenant Colonel C. C. Gee, Chief of the Personnel Section in Washington, authorized the Lower Mississippi Valley Division to designate the region of the Canadian River west of the Texas-New Mexico state line as the Tucumcari District. This appellation lasted only until 1 October 1936, when Captain Kramer moved all activities of the District to the damsite and renamed it the "Conchas District." Colonel Gee also ordered LMVD to transport at once all pertinent records and property to New Mexico. Simultaneously the Corps approached civilian employees in the Division to transfer to the site, with the first to arrive being James S. Wilborn.[35]

As a Corps employee in western Oklahoma, Wilborn was familiar with the geography and climate of the Conchas area. He was also fortunate to have worked in his profession in the 1930s, and volunteered to leave for Tucumcari at once. He became the first District employee at the site in New Mexico, and remembered unpacking the furniture and records sent from the Memphis District. Wilborn marveled at the fact that the local citizenry descended upon the abandoned store that would serve as the first District offices with offers of help to unload the materials. The residents then sought permission to carry away the wood from the crates to use in their homes.[36]

Within a week Captain Kramer had taken command as the District Engineer at Tucumcari. When survey crews moved out from town to the prospective damsite, they confronted such problems as the arid conditions of the High Plains and the isolation and remoteness of Conchas. To reach the damsite the crews drove 30 miles west of Tucumcari to the small railroad town of Newkirk, and then an additional 30 miles north, through ranchers' property blocked by more than one dozen wire gates. At first the surveyors made the 120-mile sojourn daily, but soon acquired Army tents to establish a permanent camp. At week's end the crews would return to Tucumcari, where their families resided, and where they could avail themselves of such amenities as hot showers, home-cooked meals, and the social life of the town.[37]

Conditions at the survey camp improved when the WPA offices in Santa Fe and Amarillo began hiring unemployed laborers for Conchas. The ERA Act of 1935 stipulated that 80 percent of the Conchas work force would come from New Mexico, and 20 percent from west Texas. The first WPA crew arrived at the survey camp about 7 August, and began construction of living quarters for themselves and the surveyors. Because the area lacked large stands of timber, and because the predominantly Hispanic work force was familiar with the native style of adobe housing, the Corps set them to work shaping mud from the river bank into bricks, or chipping stone from the nearby shale cliffs. By the end of 1936, the Conchas townsite boasted of dormitory quarters and a family living area for over 2,000 persons. Also in the townsite were facilities for individuals engaged in providing goods and service to the growing community.[38]

In 1935 the efforts of all parties concerned in acquiring the lands and monies for Conchas Dam seemed Herculean. But that sentiment faded as the enormity of the task of construction emerged. The Corps had no useful weather data with which to predict streamflow quantities. The District asked the Laboratory of Anthropology in Santa Fe to identify someone knowledgeable of research in charting precipitation through tree-ring data. Professor A. E. Douglas, of the Steward Observatory at the University of Arizona, offered his calculations. His work, however, applied to the more moist regions north of Flagstaff, Arizona, and the District could not use his information. It seemed as if the speculation of local ranchers that the dam would never hold water might be true. Even Captain Kramer did not believe that the Canadian River could supply the necessary acre-feet until the gates closed in late 1938.[39]

After the survey crews determined the best location for the damsite, the means by which materials and equipment would reach Conchas became paramount. The Corps marked out and graded a gravel road from the site to the Santa Fe railroad in Newkirk, creating a small boomtown around the shipping and receiving activities. The District then negotiated with the Tucumcari natural gas utility to construct and operate a 31-mile long pipeline, and to provide power to the camp by means of six large electric generators. Newkirk had a cement-batching plant that supplied concrete for the dam, and contracts were let in 1936 to begin all phases of construction.[40]

The next major question facing Captain Kramer and his staff involved the selection and training of a competent work force. Technical and logistical problems could be overcome by means of the high degree of competency possessed by the Corps officers and the civilian engineers. More troubling was the use of relief workers with few trade skills, and who often came from a different cultural and linguistic background than their supervisors. Because everyone knew that Conchas existed to combat the chronic unemployment situation of New Mexico and west Texas, thousands of people flocked to the site hoping to find work. In order to handle the crush of humanity, the state WPA director advised his local officials to process applications away from Conchas and to send individuals to the site only after complete screening. A complicated formula arose for eligibility, based on one's period of relief, the number of dependents, and as some would later charge, one's support for the Democratic political machines of the state's prominent leaders.

Those individuals fortunate enough to be hired at Conchas would arrive to find two separate housing arrangements. The majority of workers did not remain on the job continuously, so that more people could work on the project. Several temporary communities appeared nearby, known as Gate City, Mesa

Rica, and Hooverville. These places held workers and their families who waited for their recall to the dam or hoped to find some employment in one of the service industries attached to the project. Few of these people could afford proper housing materials, and local residents referred to living conditions as "chicken shacks" or "lean-to's." Weather conditions on the High Plains added to the inconvenience of the relief workers, and the transient nature of the towns meant that the basic amenities of schooling, health care, and entertainment went begging.[41]

Because the labor situation fluctuated dramatically, much time was lost in the early months of construction in training and supervision. The civil service employees had to teach the use of heavy equipment, soil and rock testing, and similar tasks. Many details required advanced skills, but the federal government stipulated that 90 percent of all workers be WPA referrals. Most had little formal education, and were more familiar with farm and ranch work than with construction and maintenance. Then criticism of hiring practices emerged when the Corps brought in its own management and engineering personnel, and the contractors turned to skilled work crews from outside New Mexico to reduce expenses and time. Engineering graduates from the New Mexico Agricultural College in Las Cruces disliked their inability to find employment at the dam, while residents of Las Vegas, Santa Fe and Albuquerque besieged their elected representatives with demands for investigations of the Corps' hiring practices.[42]

Given the circumstances of employment, management, and conditions at Conchas Dam, tensions were bound to arise. More than 60 percent of the WPA workers were of Hispanic origin, causing certain problems of communications for the English-speaking supervisory personnel. Bent Brothers, Inc., and Griffith Company, the primary contractors on the main section of the dam, engaged in the practice of hiring Mexican nationals from their home base of Los Angeles. These workers had more skills than the native people of New Mexico, and were more conversant with the techniques of the Bent Brothers. Their presence, however, created dissension within the labor camps. Faced with the problem of rejecting a large percentage of the Bent Brothers' labor force as illegal aliens, Captain Kramer decided that since the contractor received no Emergency Relief Act monies for his work, he could employ whomever he wished.

The decision on Bent Brothers' Mexican workers dramatized two issues troubling Kramer and the Corps. They wished to construct a facility that would stand the test of time and provide flood protection and irrigation water storage at a minimum cost to the taxpayers. Yet they did so with laborers not suited for many of these tasks, and the District had difficulty understanding the ways of the New Mexicans. This latter situation caused Bent Brothers to assign preferential seating in the mess hall for their managerial staff. The contractor referred to the supervisors as "a higher class of men," and saw the arrangement as a necessary perquisite for their skilled people. Captain Kramer understood Bent Brothers' concern, but also believed that segregation in the dining hall would be undesirable and affect the morale of all employees.[43]

Kramer's response did not please the officials of Bent Brothers, yet it was in keeping with his managerial style. Educated in Germany at the University of Dresden, Kramer held a Ph.D. in engineering with his thesis written in technical German. Retirees of the Albuquerque District remembered the Conchas commander as "a rough son of a gun," and a "stern taskmaster." The captain himself recognized his temperament, but contended that the enormity and complexity of his duties required no less of him. On 14 August 1937, Kramer called

in all of his key personnel for a conference on discipline and loyalty. Certain individuals had complained about inefficiency and insubordinate workers. Kramer knew that the early days of construction had caused much confusion and duplication of services. These deficiencies had become standard procedures for some employees. Kramer demanded superior quality from his staff, and promised to uphold his criteria for all workers. "I am cognizant of the fact," he admitted, "that I have a habit of occasional severe personal bluntness." He assured his staff that he meant no "personal malice" by his remarks. "Any such interpretation," he declared, "is yours, not mine." He offered to be available at any hour of the day to discuss the problems of his employees, whether relief or civil service, and concluded that "if you don't like it, now is the time to make up your mind."[44]

Kramer's directness at the 1937 conference underscored his basic fairness and sense of justice towards his employees. This quality helped defuse the potential embarrassment of the handling of WPA workers by state and federal officials in charge of hiring. In 1938 a reporter for the Los Angeles *Herald-Examiner* came to New Mexico to study the brewing scandal involving relief money and important New Mexican politicians. Dennis Chavez faced charges of placing 18 of his relatives and family members on various WPA payrolls, and while no convictions resulted, the U.S. Senate threatened to remove Chavez from that body for his connection with the scandal.[45]

As an important element of the WPA program in New Mexico, Conchas Dam came under the scrutiny of federal investigators and the eye of A. H. Frederick of the *Herald-Examiner*. U.S. Attorney Everett Grantham was in charge of prosecuting 73 defendants, among whom were a sister, nephew, and son-in-law of Dennis Chavez. Grantham told Frederick that WPA supervisors throughout the state would approach workers for political "contributions" scaled to their monthly wages. These ranged from two dollars per month for unskilled employees up to ten percent asked of foremen at Conchas Dam, whose pay averaged $125-150 monthly. If the worker refused to support the Chavez machine, said Grantham, he or she had their salary reduced. In extreme cases the reluctant employee would be transferred from work in his hometown to Conchas Dam. Very few WPA workers ignored these demands, according to the U.S. Attorney, because it could mean leaving one's home and family to work 200 miles away. Those individuals who opposed the machine came to call Conchas Dam "Devil's Island," in the words of Grantham, because of its alleged similarity to the notorious prison camp off the coast of South Carolina.

To avoid charges of patronage and favoritism, Kramer dismissed the appeals of Governor Tingley and others to name political cronies of the New Mexico Democratic party as concessionaires at Conchas. Before Congress had appropriated funds for the dam, Tingley had received letters from friends and associates recommending people who sought employment in private business at Conchas. Mrs. Walter Giles of Bernalillo, New Mexico, operated a restaurant and boarding house near Albuquerque. The hard times of the Depression had curtailed her business. Mrs. Giles reminded Tingley that her husband had voted the straight Democratic ticket since the establishment of New Mexican statehood in 1912, even when such behavior threatened his job. "We are where we need a friend of the party," she said, "as we have been to them." The Giles' requested the "concession for the eating house at that place [Conchas]," and they believed that Tingley could deliver on their petition.[46]

As the project came to life, other more prominent citizens cast their for-

tunes at the feet of the Army Engineers for consideration as service personnel. Rudolf Sotherland addressed his desire to open a drug store at Conchas not only to Governor Tingley but to Senators Hatch and Chavez as well. Sotherland had run as a Democrat in the 1934 general election for Colfax county superintendent, but lost to a Republican by a narrow margin. Sotherland knew that Tingley could not "directly grant me a concession to put in a drug store at Conchas Dam," but he and "the boys" from Colfax county "would certainly appreciate it." Sotherland vowed "one hundred percent support" for the Democratic ticket in the upcoming presidential election of 1936, and offered Senator Chavez "to do for you whatever I can, and I will do it gladly."[47]

Captain Kramer endured several dozen similar requests for concessions, declining each offer by stating that a formal bidding process would ensue once the District understood the specific needs of its employees. This position did not please George J. Lins of Tucumcari, who wrote Governor Tingley criticizing the procurement policies of the Army Engineers. Lins owned "The Lins Broom and Broomcorn Company," and took exception to Kramer's purchase of brooms at Conchas from the federal prison industries program at Fort Leavenworth. Government regulations held that the Engineers should acquire as many materials as possible from government suppliers. Lins had a point when he noted that the Corps had to ship the brooms from Kansas to Fort Bliss, and then north to Tucumcari and Conchas. This was a service Lins could provide in town at a lower rate. "Why spend millions of dollars of relief money," said the broommaker, "and then put the free labor and farmers of the state in competition to Prison labor and prison made goods."[48]

With the problems of surveying, hiring workers, and acquiring rights of way behind him, Captain Kramer devoted his attention in early 1936 to formulating a bid process for concessions. Circular No. 70, dated 26 February, outlined the procedure for application to the Tucumcari District to provide the following services: grocery store, meat market, drug store, department store, barber and beauty shops, shoe repair, shoe store, dry cleaner and tailor, automobile garage, newsstand and confectionary, and a restaurant. Kramer estimated the size of the Conchas camp to reach 3,000 at its peak, and warned prospective concessionaires that population levels would fluctuate. In addition, the captain noted the majority of the work force would be "Spanish-American." Proprietors would pay certain fees for rental, utilities, and police and fire protection, while housing would be available at a reasonable rate. Kramer stood ready to demand specific degrees of quality for all goods and services provided, and the government expressly stated that it could not guarantee any particular return on the investment of any concessionaire.[49]

Of all the services offered by the concessions at Conchas, the one remembered most by District employees was the motion picture theatre. Constructed of adobe with projecting wooden beams or "vigas," the facility seated 670 patrons and was the most popular spot in camp. Lonnie Horton, a retired maintenance worker at the dam, recalled his teenaged years as a cowboy on the adjoining Bell Ranch when he and his friends came to the camp on Saturday nights to socialize and attend the only movie show for miles. Captain Kramer anticipated this phenomenon, and wrote out a special circular on the theatre. The Engineers would construct and outfit the hall, with the proprietor required to furnish seats, drapes, and film and sound equipment. The manager would then present a minimum of three shows daily during a seven-day week. The theatre owner would also provide a schedule change "at least five times per week," sub-

mit the booking list to Kramer for prior approval, and charge no more than 30 cents for general admission. The captain also hoped to bring some measure of culture to the camp by requiring the theatre manager to leave vacant two evenings per month so that traveling troupes of WPA actors and musicians could entertain the employees and their families.[50]

If Kramer knew of the potential for the Conchas movie theatre, he also recognized the need for other social and cultural diversions. A percentage of the profits from that establishment went towards the activities of the Conchas Dam Recreation Association. Due to its isolation and its number of eastern urban dwellers among its staff and management, the camp called upon the talents of its residents to determine the best forms of amusement. A local theatre group put on one-act plays, while the music club offered recitals and choir performances. A nine-hole golf course and tennis courts were placed under construction, as was a hunting lodge just off the premises that offered luxury accommodations and the only swimming pool for 60 miles in any direction. Outdoor sports in the summertime gave many employees the opportunity to explore the beauty and openness of the surrounding mesa and canyon country, once traversed by bands of Indians moving between the mountains and the buffalo plains to the east.[51]

As more families arrived at Conchas to take up work at the dam, the District realized that it had to provide more education for children of the workers. The youth faced a 60-mile roundtrip bus ride to the nearest elementary school in Newkirk, while the teenagers required transportation to Tucumcari to attend the local high school. Because the staff of the Corps and the construction company included many individuals with college degrees, they knew of their childrens' need to acquire the best quality education possible to compensate for their geographical isolation. Therefore Captain Kramer approached Governor Tingley in November 1935, seeking state funds for teachers, textbooks, and a school at Conchas. Nothing could be done to salvage that first academic year, but the WPA hired three grade school teachers for Conchas during the 1936-1937 term. The following year the state agreed to meet the needs of the growing population by establishing both an elementary and secondary school at Conchas, with a total enrollment of 150 pupils. The high school athletic teams performed against other squads from Tucumcari and Santa Rosa, and Newkirk became the gathering spot for high school socializing.[52]

The increased population at Conchas Dam also brought problems of a more serious nature than schooling. Captain Kramer contended with all manner of social ills at the camp, and in the neighboring towns of Mesa Rica and Gate City. These included criminal activities, the sale of liquor, and the obvious health hazards generated by the crowded conditions and lack of proper medical facilities. In August 1937, David Branch of Gate City petitioned the New Mexico State Division of Liquor Control to grant him a license to sell liquor outside the construction camp. In 1936 the state had entered into an unusual agreement with the War Department to prohibit the issuance of liquor license within a 25-mile radius of Conchas Dam. A fear of employee intoxication prompted this move, but Branch argued before the Las Vegas District Court that social diversions outside the camp were rare, and that the distances to Newkirk and Tucumcari either denied many workers access to liquor or led to traffic accidents as people sought a supply of alcohol.

Upon hearing of Branch's request, Kramer addressed Governor Tingley on the matter in no uncertain terms. The temporary communities housed "respecta-

ble American families," said the captain, "whose bread-winners are helping to build the Conchas Dam project." Although their homes were "unpretentious," the citizenry maintained them adequately and in accord with the state health codes. David Branch's proposal, enhanced by a favorable court ruling, threatened this tranquility. "Vices inimical to a clean, residential community," Kramer warned, "cannot thrive, indeed cannot obtain a foothold, without the entering wedge of free flowing liquor." The captain professed no sense of "prudery or paternalism" in his objections, and admitted that his opinions carried little weight on the matter. All Kramer could hope for was that "a grievous mistake and a shameful blot on the escutcheon of the state of New Mexico may be avoided."[53]

Despite the pleas of the District Engineer, the Liquor Division reversed its earlier judgment on the Branch application, leading others to file for similar licenses in the Conchas area. Within weeks of issuance of these permits in Gate City and Mesa Rica, local residents complained of unsavory characters frequenting the various saloons. On 9 February 1938, the District Attorney from Las Vegas arrived unannounced at Conchas to raid the outlying communities, charging several individuals with violations of the New Mexico gambling and vice statutes. Henry Nelson, manager of the Conchas billiard parlor, received notice that gambling by card players at the dam would result in another raid if not halted immediately. Rumor had it that professional gamblers met ready acceptance in the local card games, and Captain Kramer needed a solution. He petitioned the state government to enhance the police surveillance of the two communities, believing that he had a "moral responsibility" for the conditions at Gate City and Mesa Rica.[54]

Of equal or greater concern to the District was the matter of adequate health care. The Army Engineers requested of the Public Health Service a medical officer to attend to the federal employees at Conchas. The principal contractor, Bent Brothers, utilized the services of the Pacific Employees Liability Insurance Company of Los Angles to provide a contract physician for their workers. Despite the dimensions of the project, Conchas maintained a high level of safety, suffering only one fatality in over three years of existence. The situation was not as agreeable for the residents outside the compound, however. No physicians served Gate City or Mesa Rica on a regular basis, and the town of Tucumcari had no hospital until early in 1938. This necessitated the transfer of emergency cases to Amarillo, a distance of 180 miles.

Even though the Engineers did all in their power to operate a safe and clean facility, the threat of contagious disease existed all around the camp. Captain Kramer exceeded his authority in 1936 by permitting the government medical officer, a Doctor Bernstein, to handle cases from outside the camp on a fee basis. Bernstein found himself constantly called to the side of women in labor, leading him to believe that all the women in the Conchas area were continuously pregnant. Pneumonic cases in the winter distracted his attention further, and particularly bothersome were the outbreaks of venereal disease. Bernstein resorted to working with private cases on government time and pocketing the fees. Kramer understood the predicament of his medical officer, but felt compelled to release him. The District Engineer finally arranged with the contractor's physician to assist the federal doctor whenever possible, alleviating the need for an additional position at the Conchas Dam infirmary.[55]

Social conditions at Conchas absorbed a good portion of Captain Kramer's time, taking away from his primary concern of construction on the dam. Yet

from the earliest days of the District the Corps assigned him other tasks in New Mexico. In late September 1935 Congress took note of the increased criticism of water projects built under the auspices of WPA relief laborers. Many such public works suffered from faulty design, hastily trained crews, lack of professional supervisory personnel, and the involvement of local politicians in the selection of these projects. In order to bring some scientific enterprise to the WPA, the legislators appointed the Corps as engineering consultants to that agency. Each of eleven regional representatives would offer technical advice to the WPA on construction and maintenance of the hundreds of water projects under its purview. They also had the power to prohibit the commencement or continuation of public works that the Corps deemed safe or unnecessary.[56]

In New Mexico the Conchas District worked closely with officials from the state offices of the WPA. The District Engineer responded to requests for review and commentary on more than 15 proposed and completed water projects. These public works touched nearly all portions of the state, from Sugarite near Raton to Bear Canyon east of Silver City. The majority of these projects were in the mountainous areas of northern and central New Mexico, where unemployment had remained constant since the early days of the 20th century. In the southern part of the state the Corps found that the work force on several projects consisted of 60 to 80 percent Mexican nationals, which contributed to the WPA's problems of communications and management. On several occasions the Corps rejected New Mexico proposals as ineffective, citing the need for more substantial work than the $25,000 ceiling set by the agency would allow. The District gained valuable experience and knowledge about the arid Southwest from these activities that would serve it well in the heady days of civil works construction after World War II. Because of its presence the Corps received appeals from other federal agencies to inspect its work as well.[57]

After some 25 months of existence, the Conchas District underwent a preliminary investigation by the Office of the Chief of Engineers [OCE] to consider the District's future. The completion of its primary mission stood another two years in the offing, yet regional and nationwide events necessitated new planning strategies for the Corps and the District. The relationship between the Army Engineers and the WPA had benefited all concerned, with the latter agency prepared to fund additional Corps-supervised projects as part of its relief efforts. This turn of events brought the Conchas area under close scrutiny as Dust Bowl conditions deteriorated late into the decade. The Bankhead-Jones Farm Tenant Act of 1937 authorized the Agricultural Department to spend $50 million within three years on a program of "land conservation and land utilization" in the ten-state Dust Bowl region. In addition, the WPA proposed a similar water conservation campaign of $40 million. Finally the Conchas District anticipated commencement of activities at Caddoa Dam on the Arkansas River in southeastern Colorado at any time.

With an eye towards expanding the workload of the Conchas District, OCE suggested that Captain Kramer shift the bulk of his staff to Amarillo. This would place the Corps in the heart of the Dust Bowl, where WPA, Bureau of Reclamation, and the newly formed Soil Conservation Service all maintained regional offices. Thus the Corps could avail itself of a central location for purchases, communication, and promotion of interagency policies that mitigated the severity of agricultural conditions on the High Plains. The Chief of Engineers requested commentary on this realignment, and especially sought out the expertise gained by Captain Kramer in two years of arid-lands work.[58]

The District Engineer's response revealed the impact of work at the Conchas Dam on the surrounding area, and the favorable reception given the Corps by local business and civic officials. Kramer noted that the plans of the Southwestern Division called for a project office at Conchas, directed by Captain L. H. Foote. Removal of all other functions would entail a manageable amount of expense in time and money, and the savings in travel and communications would balance out the initial costs of moving to Amarillo. The District had two current authorities at Caddoa, Colorado, and Optima, Oklahoma. Ironically these also made Amarillo a logical geographical center of operations. "As any visitor or inspecting official can testify," Kramer mused, "the accessibility of Conchas Dam ranks about at the bottom of any rating list." Yet the challenge presented by Conchas had worked on the mind of the Captain, to the extent that he recommended a project office in Amarillo and retention of the District headquarters in New Mexico. The Southwestern Division compromised by leaving Conchas as it stood, and dropping the idea of a west Texas base of operations.[59]

By the spring of 1939 two factors merged to change the history of the District. Construction on Conchas Dam was nearly complete, with plans for storage of water already underway. At the same time the Division office had decided on the new direction of Conchas District. As of 1 June 1939, the District would include the Arkansas River from its headwaters near Leadville, Colorado on the Continental Divide, downstream to Walnut City, Kansas. The District would maintain a resident manager's office at Conchas, with the remainder of the staff to accept reassignment to Caddoa that summer. Problems of Colorado land acquisition with the Santa Fe Railroad meant that a specific date for removal could not be made, but Captain Kramer warned his personnel not to seek transfers to other districts without his approval.[60]

As the Southwestern Division made plans to reinvigorate the Conchas District, Captain Kramer and his staff confronted the question of concluding their work at the dam and preparing for operations and maintenance of the facility. The main gates closed on 29 December 1938, and water began backing up almost immediately. Because of the severe drought conditions throughout the 1930s, local residents assumed that the reservoir would not fill. Their skepticism proved groundless as the Conchas and Canadian Rivers carried enough water to fill the pool within six weeks. All that remained for the construction crews was completion of the irrigation works for the Arch Hurley Conservancy District. World War II halted this task, and it was not until November 1945 that waters flowed through the canals to farmers below the dam. By 1949 the Bureau of Reclamation had arranged the distribution system to everyone's satisfaction, and the Corps became responsible for delivery of all waters between flood stage and permanent pool levels for the only irrigation customer at Conchas.[61]

A second task requiring the attention of the District before the transfer to Caddoa was the matter of formal ceremonies for dedication of the Conchas project. In March 1939, Captain Kramer asked Carl Hatch to intercede with President Roosevelt to attend the ceremonies. Kramer knew that Roosevelt often journeyed west by train every summer, and that he supported large public works projects that provided benefits to many people. Local officials in Tucumcari hoped to persuade Edwin Watson, secretary to the President, to include Conchas on any planned itinerary, in part because Watson had married a young woman from the Tucumcari area.

In July the secretary declined the offer in the President's name, citing de-

lays in the scheduled departure for the West Coast. Kramer remained undaunted, appealing to New Mexico Governor John E. Miles to invite Roosevelt the next year as part of the upcoming Coronado Cuarto Centennial in 1940. The state planned a year-long series of social and cultural activities to commemorate the arrival of the first Spanish conquistadores in the Southwest 400 years earlier. To replace the President the captain recommended Harry H. Woodring, Secretary of War. When Woodring could not accept the offer, the honor of master of ceremonies fell to the senior Senator from New Mexico, Carl Hatch.[62]

The last major concern for the Army Engineers at Conchas was the matter of relations with the Bell Ranch and the State of New Mexico over the use of the permanent pool. When Congress appropriated funds for Conchas in 1935, it had sought to alleviate the unemployment of the area and to provide some means of water conservation for the New Mexico section of the Dust Bowl. With that in mind, the Red River Valley Corporation had deeded to the Corps only the land where the dam would be built, and elected to retain much of the prospective shoreline of the reservoir. As water backed up behind the dam, however, many residents of eastern New Mexico and west Texas recognized a function for Conchas beyond its original mission: the opportunity for recreational use in an area devoid of any large body of water.

Like his contemporaries elsewhere in the Corps, the correspondence of Captain Kramer does not reveal any awareness of the recreational potential of the dam in its early days of existence. Saddled with questions of logistics, political intrigue, and commencement of the project, Kramer deferred the idea of recreation to future managers of the facility. The Bell Ranch, upon whose lands any such activity would occur, kept a close watch on public pressure for access to the pool. Having observed at length the behavior of Governor Tingley and Arch Hurley to secure funding, the ranch officials preferred management of the reservoir by the Army Engineers. This would relieve the ranch of the financial burden of policing the area, and would save the state from maintaining properties for which the Bell Ranch felt it was neither prepared nor equipped to do.[63]

Despite the misgivings of the Red River Valley Corporation, the Engineers did not wish to operate the reservoir for the purposes of recreation. Looming on the horizon was the construction of Caddoa Dam and the uncertainty of the war in Europe. In addition, the Engineers had little or no training in the area of resource management, and would not undertake such a mission in New Mexico until the 1970s. The Corps preferred to apply its skills in civil engineering to a project, maintain its necessary functions, and contract with a state agency to provide any other services. Therefore the Conchas District arranged with the National Park Service to remove the housing structures from the construction camp in 1940, as per the agreement with the Bell Ranch. The District also turned over to the New Mexico State Game and Fish Department the responsibility for stocking the lake and licensing fishermen, while the state Park Commission took control of the picnic areas and boating ramps.

Although the Corps no longer operated at Conchas as it had at the peak of construction, the problems that had bedeviled the project since its inception did not vanish. The Bell Ranch took exception to what it perceived as laxity on the part of the state agencies involved in recreational programs. The ranch inveighed against the state and the Corps to remove trespassers from its lands. Differences of opinion led ranch officials to seek relief in the New Mexico district courts, arguing that water from the reservoir that covered lands claimed by the Bell Ranch could be maintained for the ranch, to the exclusion of

sportsmen and picnickers.

The conflict between the ranch and the state of New Mexico culminated in the case of *State of New Mexico ex rel. State Game and Fish Office v. Red River Valley Improvement Association* [51 N.M. 207]. The state Supreme Court held that the ranch officials were wrong to pursue such a course of action at Conchas, and that the public had a right to use the waters of the reservoir for fishing and boating. The Bell Ranch erred in its contention that the waters of the Canadian and Conchas Rivers flowing through its lands constituted a private riparian water right. Even though someone whom the Court described as "a subordinate official of the War Department" had encouraged public use of the waters before all claims could be decided, the judge concluded that the public nature of the streams of New Mexico rendered the arguments of the Bell Ranch inappropriate and invalid.[64]

By November 1939, Captain Kramer and his staff had left Conchas and established a new engineer district at Caddoa, Colorado. In the meantime the captain had remarried and brought his new bride to the compound at Conchas just one week after leaving Washington, DC. The employees threw a huge reception in their honor, and the New Mexico state highway patrol escorted them from the railroad station at Newkirk to the damsite. There the staff brought out a giant earthmover and put the newlyweds in the bucket for a final journey to the door of their new home. Captain Kramer's sense of military discipline carried over to the festivities, where he stood in the receiving line for hours to speak to all who attended. His bride, not accustomed to the exertion of the trip to Conchas, nor the 4,000 foot altitude, collapsed while trying to stay in line with her husband. No harm came to her, and the staff nicknamed her the "Unconscious Bride of Conchas Dam."[65]

The departing District employees left behind what all interested parties considered an engineering masterpiece. Conchas Dam stood 235 feet high and 1,250 feet in length. Together with the earthen dikes the concrete gravity structure stretched some four miles across the floodplain, retaining over 550,000 acre-feet of water. The Corps had expended a total of $15.5 million for land purchases, construction and maintenance. Ranch manager Albert Mitchell informed Captain Kramer that he had changed his mind about Conchas and the Corps. He no longer opposed the Engineers' presence, and had high praise for their professionalism and management style. Mitchell had taken a liking to Kramer and his wife, inviting them on the annual antelope hunt and chuckwagon breakfast on the open range. He also gave them a branding iron in the shape of a bell that had been used in the roundup of Bell Ranch cattle.

Others benefited as well from the work of the District at Conchas Dam. Over 3,000 individuals had found work there, either through the WPA or the private contractors. The state of New Mexico had a new park, complete with a permanent pool. The Arch Hurley Conservancy District had a dependable source of water for irrigation, Tucumcari had increased flood protection, and the Army Engineers had surmounted impressive obstacles in their efforts to complete the dam.[66]

The Conchas District had neither the time to reflect on its past achievements by 1939, nor could it venture a guess as to the consequences its work would have in the future. Less than a decade earlier the Corps had shown little interest in the arid Southwest. Its traditional mission embraced flood protection on navigable streams, construction of rivers and harbors improvements, and assistance to the U. S. military at bases around the world. Yet with the comple-

tion of Conchas Dam the Engineers looked towards a second project of similar proportions in southeastern Colorado, and to additional civil works authorizations on others streams in the Southwest. The unfolding crises across the Atlantic also signalled a need for national preparedness, and the isolated reaches of the new Caddoa District would attract a large share of military construction, and lead to the establishment of a permanent Engineer headquarters in New Mexico.

III

EXPANSION OF THE DISTRICT INTO COLORADO: JOHN MARTIN DAM

The success of the Army Engineers at Conchas Dam placed the District in a unique position. It had gained valuable experience and knowledge of conditions in the Southwest, and also had brought some measure of economic relief to a region devastated by the Depression and the Dust Bowl. At the same time, political and civic leaders in Colorado wanted similar projects for their state. Farmers and ranchers in southeastern Colorado kept close watch on the impressive federal activity on the Canadian River, and appealed to their political leaders to lure the Army Engineers to the Arkansas River Basin. For its part, the Corps wished to remain in the Southwest to utilize the resources of the area as World War II drew nearer. To satisfy the needs of all parties concerned, the Office of the Chief of Engineers directed the Conchas District to remove north to the small railroad town of Caddoa, Colorado, and begin work on its second major water project, known today as John Martin Dam and Reservoir.

Although the stated purposes of Conchas and Caddoa Dams paralleled each other, the two projects offered striking contrasts that mirrored the differences between New Mexico and Colorado. The demands for Conchas Dam had come from state and local officials hoping to ease the financial burden of the Depression in eastern New Mexico. The groups supporting Caddoa were irrigation companies, their bankers and lawyers. Colorado had gone through several cycles of "boom and bust" on its eastern plains in the preceding half-century, and local residents always looked for means to guarantee success in their battle with nature. The fact that many Dust Bowl victims had courted disaster through their dry-farming techniques and overuse of marginal lands did not deter the citizens of the Arkansas valley, who saw better access to the river as the cure for their ills.

In a sense the failure of Colorado to receive funding for Caddoa Dam before 1938 was a reflection of the state's historical growth and of its conservative political climate. New Mexico could make a legitimate case to liberal New Deal administrators about suffering from colonial and territorial domination. The majority of New Mexico's citizens were of Hispanic or American Indian background, and had not shared in the benefits accruing to New Mexico after the arrival of technology in the late nineteenth century. The Democratic party gained prominence in the 1930s through its pledge to these ethnic constituencies to improve their economic conditions, mainly with federal social welfare programs. Clyde Tingley, Dennis Chavez, Arch Hurley and others understood the locus of power in the Roosevelt administration, especially the administration's desire to uplift the masses and to offer them a share of America's bounty. If the politicians' determination included a desire to profit financially from these programs, that only echoed the tactics of the 19th century Santa Fe Ring, and made them more determined to succeed.

As with most portions of the interior West, the Arkansas valley both bene-

fited and suffered from the passage of land laws in the late 19th and early 20th centuries. The individualism of the frontier created demands for free access to the Arkansas River, and generated dubious claims and counterclaims of its use. Speculators acquired the best acreage, forcing new arrivals to take marginal tracts further from the stream. The Arkansas rapidly became oversubscribed and the irregularity of its annual flow left too much risk for the average farmer. Then the state of Kansas weighed in with claims to a substantial portion of the river. Kansas also raised charges of duplicity on the part of Colorado to deny southwest Kansas its chance at economic growth. The debate raged for years, with the U.S. Supreme Court the final arbiter.[1]

In the case of *Kansas v. Colorado* (1907), the justices broke new ground in western water law and set the stage for the decision 30 years later to build Caddoa Dam. The state of Kansas had a "split personality" regarding its use of streamflow because its wet eastern sections controlled the state's political and economic life. Kansas attorneys argued that the traditional British common law of riparian water rights governed all streams within its borders. This practice had evolved from the "wetlands" concept of stream usage, where only those individuals whose lands adjoined a source of water could avail themselves of its flow. Colorado's brief before the court contended that the aridity of the Plains negated European customs, and favored the solution utilized by the gold miners of California. Whomever applied water to the land first gained priority over subsequent users, and thus insured his or her economic future in a harsh environment.

While the Supreme Court admitted that the "Colorado Doctrine" of prior appropriations smacked of selfishness, the justices concluded that western individualism required state control of water rights. Only the Mormons of Utah had attempted an equitable distribution of their streamflows, and that was because of their communal lifestyle and shared religious beliefs. The Colorado principle soon became the "law of the river" throughout the drier regions of the West, with the subsequent need for elaborate storage and delivery systems such as Caddoa Dam.[2]

Two interrelated events after 1907 spurred demands by farmers in the Arkansas valley to construct a dam and reservoir west of the Kansas state line. The Reclamation Service encouraged western irrigators to band together to attract water projects from the federal government in order to fulfill Thomas Jefferson's dream of a nation of agrarian patriots. Then the need to increase farm production in World War I led many to invest in new lands and expensive equipment, stimulated by the lure of foreign markets and government purchases of surplus crops. When these sources of income vanished in the early 1920s, so did the prosperity of the previous decade. The only recourse for Colorado's farmers resided with the federal government, and in 1925 L. H. Markham of Lamar contacted the state engineer, M. C. Hinderlider, with an appeal for studies of the Arkansas River and application for funds to the Bureau of Reclamation.[3]

The state engineer believed that Markham's request had merit, and dispatched his assistant, H. D. Amsley, to the Lamar area in October 1925. Amsley reported that the best location was the broad flood plain containing the village of Caddoa. Hinderlider then asked the Bureau to conduct a topographic field survey of the area, but received little support. Elwood Mead, the director of the agency, had made fiscal solvency the goal of the Bureau. He informed the Colorado applicants that present authorizations required "all the money which the reclamation fund has in sight for many years to come." Any new projects, the

director concluded, "even if they should be found feasible, are not very good at this time."[4]

Despite the somber words of Mead, the state engineer's office continued its search for funding of the Caddoa facility. In 1927 Hinderlider and K. I. Meeker studied the available water supply, and arrived at a figure of 500,000 acre-feet of storage for the reservoir. The Arkansas Valley Ditch Association conducted similar tests and concurred with the judgement of the state engineer. Then an "act of God," in the form of serious flooding on the lower Mississippi River in 1927, prompted the Memphis District of the Corps of Engineers to undertake surveys of the tributaries within its jurisdiction. Bolstered by $5 million in Congressional funds, the Army Engineers agreed to include a feasibility study of the upper reaches of the Arkansas, since it contributed to the flood problems along the river basin.

After several false starts, in 1931 the Corps joined with engineers from the state of Colorado to make a thorough investigation of the Caddoa area. The Army Engineers pursued a policy of close coordination with state and local water agencies. This guaranteed more specific application of Corps expertise, and also proved useful with budget requests to Congress. R. J. Tipton represented the state engineer in this work, and told his superiors that a project for water conservation and flood protection appealed most to the Army. The Corps proposed an earthfill dam of 120 feet in height, retaining 680,000 acre-feet of water and providing outlet works to limit flood flows to 10,000 cubic feet per second [cfs]. The suggested cost ranged from $9 million [the Corps' figure] to $10 million [Colorado's]. Because the Army Engineers had no Congressional mandate to construct or maintain irrigation works, it could justify only $3.25 million of the total for flood control and protection of post roads. Any project at Caddoa necessitated realignment of nearly 20 miles of Santa Fe Railway track, an expense that could absorb most of the Corps' allocation. The only alternative, said the 1931 report, was addition of irrigation to the cost-benefit equation; something which the Army Engineers could not undertake.[5]

For the next two years the Caddoa project lay dormant, as the Hoover administration showed little desire to stray from its balanced-budget economic theories. Voters nationwide opted for a change of direction with the election of Franklin D. Roosevelt, and the Arkansas valley sent to Washington John A. Martin, a Democratic lawyer from Pueblo, who voiced full support for the New Deal program. Martin had served as representative from the Fourth Congressional District from 1912 to 1917, resigning his seat to enlist in the U.S. Army in World War I. He served with distinction in Europe and achieved the rank of major. Upon his return to Colorado, Martin resumed the practice of law and accomplished the rare feat of serving again in Congress, this time from 1933 to 1939.[6]

Representative Martin had made the Caddoa project one of his priorities in the campaign, and dedicated the first months of his term to securing the necessary funds. In June 1933 the U.S. Congress passed the National Industrial Recovery Act [NIRA] to stimulate the American economy with increased wages, higher prices, and greater volume of industrial production. Section 202, Title II, of the NIRA created a "Special Board for Public Works" that solicited proposals for federal construction projects. Martin joined with Colorado Governor Edwin C. Johnson, State Attorney General Paul Prosser, and M. C. Hinderlider to petition for the Caddoa reservoir and dam. The Colorado appeal outlined three benefits for the residents of the area: flood protection, unemployment relief, and re-

solution of yet another Kansas-Colorado water dispute over the use of the Arkansas streamflow.

Of the three reasons cited by Colorado, flood control proved their most compelling argument. The most recent disaster had occurred in 1921, when a wall of water 34 feet high had raced through the town of Pueblo, discharging 250,000 cfs downstream to join other tributaries feeding the Arkansas. Since most development in the valley lay close to the river bed, the damage totals and loss of life could not be calculated, although the Santa Fe Railroad did report heavy costs to replace every bridge along its route. Earlier floods had not been recorded, but an Indian legend claimed that in the fall of 1844 the entire Arkansas valley received four feet of snow, causing severe damage when it melted rapidly. In 1859 a pioneer settler went with an Indian guide to examine deposits of river silt from the 1844 flood in the crevices of the mesa near Pueblo City Park. The state engineer's office investigated this story and concluded that the 1844 flood had run 36 feet deep and had carried as much as 200,000 cfs downstream.[7]

As to its request for providing unemployment relief, the petitioners of Colorado were on more dubious ground. No one doubted the need for relief efforts in southern Colorado, as drought conditions added their fury to the already depressed economy. The report estimated that "hundreds of workers" from the local area would be employed for up to three years. Yet the state government took a dim view of federal expenditures on welfare programs in general, considering them unnecessary and destructive of the spirit of individualism that Coloradoans cherished. The state legislature faced angry mobs in January 1934 when it failed to submit proposals to the federal government for emergency relief funds. The conservative Democratic governor, Edwin C. "Big Ed" Johnson, argued that the New Deal had been "the biggest fraud ever perpetrated on the American people." Johnson and others could justify support for Caddoa because it would benefit farmers at no expense to the state, but his intransigence on other public welfare matters placed the project in danger.[8]

Colorado's conservatism notwithstanding, the state rested its case for Caddoa on the retention of irrigation water and its distribution to farmers along the Arkansas River. Kansas still smarted from its loss in the 1907 Supreme Court case to permit sufficient streamflows across the state line for those farmers claiming prior rights. The Colorado state engineer estimated a savings of 63,500 acre-feet annually with a storage reservoir, and most of that amount could be delivered to Kansas. Negotiations between the the states revealed support for Caddoa, and the Colorado proposal held that "the federal government has a material interest in the maintenance of friendly interstate relations."[9]

The Caddoa appeal encountered difficulties almost from its inception. The state asked that the federal government absorb all costs for the dam, in part because the local residents could not service the debt from the irrigation works, and because the state constitution prohibited appropriation of funds for public works projects. Independent ditch companies in Colorado had tax-exempt status to help defray the costs of construction and maintenance of their canals, but no organization could underwrite the $9 million in bonds that Caddoa would require.

The lack of federal support for Caddoa Dam dismayed its proponents, who regrouped to seek alternative sources of funding. Representative Martin asked for the informal opinion of the Public Works Administration, and learned that Caddoa's insistence on irrigation doomed any attempts at federal authorization.

"There is no concealment of the fact," Martin told the state engineer, "that they [federal water agencies] are wholly lacking in enthusiasm for additional irrigation facilities." Martin's colleagues in the Colorado delegation recommended tabling of the Caddoa matter, but the Pueblo Democrat disagreed. "Now and then," he told his associates, "there is a fool who is inclined to rush in where angels fear to tread. I guess I fall with the latter category."[10]

Martin then circulated a petition among his constituents to include Caddoa Dam in a basin-wide program for development of the entire length of the Arkansas, much like the Roosevelt administration's idea for the Tennessee Valley Authority. "There is one sure thing," warned Martin, "and that is that it is now or never on these big schemes." The Interstate Flood Control Commission for the Arkansas and Red River Valley, composed of representatives from all the states in the basin, asked for $12 million for projects in Colorado. Martin feared that time was of the essence. "That's about $12 million more than we could get in a year from now," he concluded, "and maybe in six months" as well.[11]

While John Martin worked on behalf of Caddoa Dam in Washington, his constituents in Lamar and other valley towns joined forces to demonstrate the need for federal financing. On 26 July 1933, the state engineer appeared before a mass meeting at La Junta to discuss the status of the Caddoa proposal. Despite the fears of Martin, the assemblage called upon its elected officials to approach the Colorado office of the PWA and ask that Caddoa be included in its agenda as a fully funded national project.

While the paperwork on Caddoa circulated through the channels of the PWA, other forces at work in the federal bureaucracy offered hope to the southern Colorado officials. The state of Oklahoma marshalled support within the Interior Department and the Office of the Chief of Engineers to create the Arkansas Basin Committee. This organization would review the 1931 report of the Army Engineers on the Arkansas, and would recommend projects for federal construction. Secretary of the Interior Harold Ickes asked the governors of the seven states involved to appoint delegates to the committee, and to have them file their report as soon as possible. Colorado selected Henry C. Vidal, a lawyer from Denver, and he joined the New Mexico representative, Arch Hurley, to campaign for Caddoa Dam.

Formation of the basin committee accelerated the work of the project supporters considerably. Its members collaborated with officials of the Memphis District of the Army Engineers, whose focus at Caddoa shifted from irrigation to either flood control projects or multipurpose reservoirs. The Corps sought an agreement with the basin states, hinting to John Martin that "but little time would be needed to beat these programs into shape for action." Through conversations with Corps officials in Washington Martin realized that Roosevelt's appointees in the various relief and recovery programs "were new to the political game." Despite their idealism and academic and professional qualifications, the administrators of the PWA and other agencies had to learn a bitter lesson. "The project hunters who stayed most persistently on the job," said Martin, "and hammered the hardest would bring home the bacon regardless of the merits of their projects." The 1935 appropriation for public works was "rapidly melting," in Martin's words, and the Congressman somberly concluded that "some bad things are going to get across and some good ones will be shut out."[12]

The informal assistance of the Corps to the Caddoa project extended beyond an explanation of the intricate methods of congressional finances. Lieutenant Hollis of the Memphis District suggested that Colorado and Kansas reach some

accord on the distribution of waters from the proposed reservoir to assure passage of any public works legislation. Kansas officials seemed reluctant to commit themselves to such an agreement. But after separate meetings in Wichita and Denver both sides declared their cooperation for Caddoa Dam, and their hope that the project would end the debate over the streamflow of the Arkansas.

While the Kansas-Colorado negotiations continued, the Army Engineers publicized their findings of economic hardship on the High Plains. This "Ferguson Report" stated that the crop failure and drought that made the Conchas project imperative also held true for southern Colorado. The Corps envisioned hiring 800-1,000 unemployed workers from the farms and coal mines of the Arkansas valley, thus reducing the need for "non-productive relief expenditures."[13]

Through the not inconsiderable efforts of the Army Engineers, the Arkansas Basin Committee completed its work in December 1933. It called for construction of 22 water projects along the length of the Arkansas, and strongly endorsed the expenditure of $7.9 million for Caddoa Dam. Harold Ickes directed the Mississippi Valley Committee of the OCE to form a Board of Review for these projects, with supporters of each to testify in Washington. At these meetings the Caddoa sponsors learned yet another lesson in the game of public works. The Corps wanted no responsibility for purchases of land, rights of way, or easements. Scandals were brewing among several projects in the Lower Mississippi Valley Division of the Corps because "local interests" failed to predetermine the costs of such items, and public announcement of the contracts without federal guarantees proved a source of embarrassment for all concerned.

To meet this new requirement, the Corps suggested that the Caddoa boosters form a local corporation to acquire lands, to maintain and operate the completed facility, and to accept liability in any suits brought against the Corps for its work. The Mississippi Valley Committee hinted privately that any such organization could expect federal reimbursement for their expenses, thus easing fears of an overwhelming financial burden on the backs of irrigators and state taxpayers. The project sponsors created the Caddoa Dam Association, led by Arthur C. Gordon, a prominent Lamar water law attorney. Gordon approached local landowners to acquire pledges of land for Caddoa, and also gained the support of the Colorado legislature.[14]

After weeks of intense lobbying by the association, the state, and interested private citizens, the Army Engineers endorsed the Caddoa project and sent its recommendations to the Senate. That body had asked the President in February to submit a list of 60 water projects for flood control, navigation, irrigation, and hydroelectric power generation. Ten would be chosen for construction in the 1935 Appropriations Act. The Mississippi Valley Committee determined that Caddoa was "sound from an engineering standpoint and economically feasible." It added Caddoa to the list and suggested a price tag of $8-$9 million.[15]

Before the Caddoa Dam enthusiasts could celebrate their triumph, however, the Army Engineers and the PWA deflated their hopes. The Review Board ruled that the flood control and river regulation aspects of the plan fell under the purview of the Corps, and that it could contribute $3.25 million to the project. Because the state of Colorado sought 100 percent federal funding, the committee appended a note to the Senate declining full participation in the work. The benefits gained from construction of Caddoa would be "largely local in character," said Major Carey H. Brown, and unless the sponsors shouldered a larger portion of the costs the dam would not be built.[16]

The proponents of Caddoa Dam reeled from this latest misfortune. Henry

Vidal wrote to Chester I. Long of his doubts for the future of the project. The Colorado representative on the Arkansas Basin Committee pointed out that Roosevelt's people knew of Colorado's constitutional restrictions on indebtedness for public works, and of the economic hardships facing the valley. The Roosevelt administration then abolished Vidal's committee, and Harold Ickes indicated that all future requests would pass through his office to be judged by a set of nationwide standards. The Corps then suggested that local participation should underwrite "a very large part" of the Caddoa project. Otherwise Major Brown "considered the matter closed."[17]

Despite the reluctance of the Army Engineers to seek authorization for Caddoa Dam, project supporters prepared for the next round of the appropriation hearings in 1935. The Water Resources Committee of the Natural Resources Board heard testimony from Colorado and Kansas officials in late 1934, and recommended inclusion of the dam in any future public works legislation. The merits of Caddoa earned the committee's highest ranking for water projects in the southwestern Mississippi and western Gulf basins. By comparison, Conchas Dam in New Mexico achieved only second place on the committee's list. The old problem of Colorado's financial participation again surfaced before the resources panel, but the Depression had changed matters considerably by 1935. Henry Vidal had learned that "social and economic results," as well as "readiness for construction," had become more pressing criteria for water projects. In this new atmosphere the Caddoa Dam Association detected a ray of hope for its endeavors.[18]

Like previous appeals, the latest Caddoa bid languished as the federal bureaucracy ground slowly towards its final conclusion. Deciding not to waste time, the Colorado state planning committee released a report in April 1935, detailing a 20-year water development scheme to fight soil erosion on the eastern plains. The state looked to Congress for over $100 million to construct approximately 200 dams, ditches, and irrigation systems. Unsurprisingly, the linchpin for this ambitious program was Caddoa Dam, considered by the state as the single most important water project for the eastern half of Colorado. By June, however, rumors of continued federal opposition to Caddoa frustrated all concerned. U.S. Senator Alva Adams warned that if the project failed again, "it is difficult to tell just what type of project of permanent benefit will be approved." Tensions ran high among the rest of the Colorado Congressional delegation. Adams spoke for all when he said: "Works relief administrators are set against any modification to meet the problems of the western states."[19]

After several more appeals by Colorado, the Natural Resources Board readied its final report to Congress. To mitigate opposition by the Corps, the state assumed responsibility for damages to private property during the construction phase of Caddoa, and agreed to maintain the finished structure. Again the state could not raise the necessary funds for land purchases. Thus it came as a great surprise to the Colorado delegation when Congress approved $4.5 million for the construction of Conchas Dam in New Mexico, and made no mention of Caddoa. M. C. Hinderlider fired off a telegram to the Chief of Engineers, asking why Conchas merited the supports of the Corps. The state engineer had heard rumors that Conchas would be started with temporary funds, and that partial construction would not endanger completion at a later date. Hinderlider wondered how New Mexico could usurp Colorado before the selection committee, given that body's preference for Caddoa Dam, and he set out to uncover the facts.[20]

For the next several days the state engineer pursued many avenues of information on Caddoa Dam. In the process he learned a great deal about the highly unorthodox methods employed by New Mexican officials to circumvent the opposition of the national water agencies. Colorado's proposal had gone before three federal panels: the National Emergency Council, the Board of Engineers for Rivers and Harbors, and the Water Resources Committee. The Army Engineers had voiced its approval, but Elwood Mead of the Bureau of Reclamation withheld judgement on the wisdom of irrigation at Caddoa. The Natural Resources Board contended that the vast majority of benefits accruing to Caddoa would go to local farmers and townspeople, and that these parties should absorb the bulk of its costs. John Martin hurried to the White House to question President Roosevelt and Harold Ickes before they left for the dedication ceremonies at Boulder Dam, and he received promises that Roosevelt would confer with the Colorado boosters while in the West.[21]

When apprised of these facts in the evaluation process for Caddoa Dam, the state engineer grew suspicious about the preferential treatment accorded the sponsors of Conchas Dam. At first Hinderlider accepted the explanations of federal officials regarding Conchas. Upon hearing of the dubious nature of the promises made by New Mexico state officials, however, he could barely disguise his sense of outrage. "We all know," said Hinderlider, "that relatively speaking the Caddoa project is far more meritorious than the Conchas project." The New Mexico proposal had come before the National Emergency Council prior to Caddoa. The council then changed its policies to require the approval of all federal agencies involved before agreeing to 100 percent federal financing. Colorado stood ready to offer the Army Engineers every condition met by New Mexico, including reallocation of state WPA monies to permit higher relief wages at Caddoa than at other sites. Hinderlider rallied against the murkiness of federal decision-making, and he vowed to find answers to the riddle of the Caddoa proposal.[22]

Because he was not privy to the negotiations between the New Mexico sponsors of Conchas Dam and federal officials, Hinderlider could not understand the machinations involved in acquiring full federal funding. "These two projects," he wrote to the Colorado senators and congressman, "are as much alike as two peas." Yet Conchas escaped the scrutiny of the Bureau of Reclamation and the Natural Resources Board. Hundred of irrigators in the Arkansas valley lined up in support of construction. But the Bureau of Reclamation told Colorado that if the Army Engineers built irrigation works with federal monies, it would jeopardize the presence of the Bureau in the West and threaten repayment schedules of the Reclamation fund. Then word leaked out that the Corps would build an irrigation outlet for only one conservancy district at Conchas, and that the local water supplies of Tucumcari and Amarillo would be enhanced by that project. New Mexico had made no guarantees, signed no irrigation contracts, nor purchased any lands. The sense of betrayal in Hinderlider's correspondence to Governor Johnson was unmistakable. "I regret exceeding to advise," the state engineer wrote, "that the lookout for immediate authorization for the construction of Caddoa does not at this time appear to be bright."[23]

Although Hinderlider feared the demise of Caddoa Dam in 1935, project sponsors refused to admit defeat a second time. John Martin and other Colorado officials reapplied to the Natural Resources Board, and benefited from yet another shift of direction in Washington on public works projects. Requirements for local support did not change, and the Conchas experience strengthened fed-

eral resolve to extract financial commitments from project sponsors. But benefits arising from unemployment relief and irrigation delivery became more legitimate in the eyes of federal officials, and the Flood Control Act of 1936 included monies to address these particular problems. Caddoa Dam received congressional approval in this fashion, with $9.7 million destined for construction and $300,000 for "lands and damages." The Little Rock District of the Corps acquired the Caddoa assignment first, and began surveys of lands and prospective sites the following year.[24]

By September 1937 the Corps had completed its preliminary work at Caddoa, revising its financial estimate upward to $14.5 million. The major cause of this increase was the contention of the Santa Fe Railroad that the relocation of its trackage would cost considerably more than anticipated. The railroad believed that excess siltage from the regulated streamflow would endanger any new bridges, and that the Little Rock District planned to build the line too close to the edge of the reservoir. Any flooding of historical magnitude threatened the railroad's operations, and the clause in the Caddoa agreement with Colorado calling for state liability for damages disturbed Santa Fe officials. Congress finally stepped in to solve the dispute by including in the Flood Control Act of 1938 a provision removing all requirements for local participation at Caddoa. The Corps would build, operate, and maintain the facility, and the benefits of flood control and irrigation that had scuttled the project in 1935 were now granted free to the residents of the Arkansas valley.[25]

Several months after Congressional approval of the Caddoa project, the Office of the Chief of Engineers realized that the Little Rock District was too far away from the reservoir site for efficient management and communications. The Conchas District had completed most of its construction in New Mexico by early 1939, and would need more work to remain intact. On 1 June 1939, OCE directed Captain Kramer to ready his staff for its new assignment in southern Colorado. On 4 November the District Engineer joined the other civilian and military personnel at Caddoa. Three weeks later the Conchas office became known as the Caddoa District, a name that was retained until transfer to permanent headquarters in Albuquerque.[26]

In the intervening months between acquisition of the Caddoa project and Captain Kramer's arrival, the District employees conducted surveys, explorations, and design studies. Rather than complain about the intransigence of the Santa Fe Railroad, Kramer utilized the delays caused by litigation to reassess the work of the Little Rock crews, and adjust their findings to Kramer's specifications. Little Rock completed its analyses of the tributaries of the Arkansas River above the damsite and below Pueblo, while the new District constructed temporary headquarters, purchased tracts of land around the site and began the transfer of personnel from Conchas. Anticipating an amicable settlement with the Santa Fe Railroad, the District began working on the new road bed, built bridges, and installed the signalling system.[27]

With the award of the main dam contract to a group calling itself the "Caddoa Constructors," the District soon realized the value of its experiences at Conchas Dam. Absent were the pressures from local politicians, job seekers, isolation from centers of population, and the like. By 1939 the unemployment relief phase of the New Deal had been repudiated by a more conservative U.S. Congress. Although the Dust Bowl conditions of mid-decade had yet to improve, those residents of southeastern Colorado who had survived looked to Caddoa Dam with renewed hopes. Fears that a "government boondoggle" would arise in



Plate No. 15. Caddoa, Colorado Post Office, 1939



Plate No. 16. Relocation of Railroad Track in Winter at Caddoa, 1940



Plate No. 17. Caddoa District Headquarters, Caddoa Reservoir, 1940



Plate No. 18. New Concrete Mixer at Caddoa Dam



Plate No. 19. North View of Overflow Section, John Martin Dam, 1943

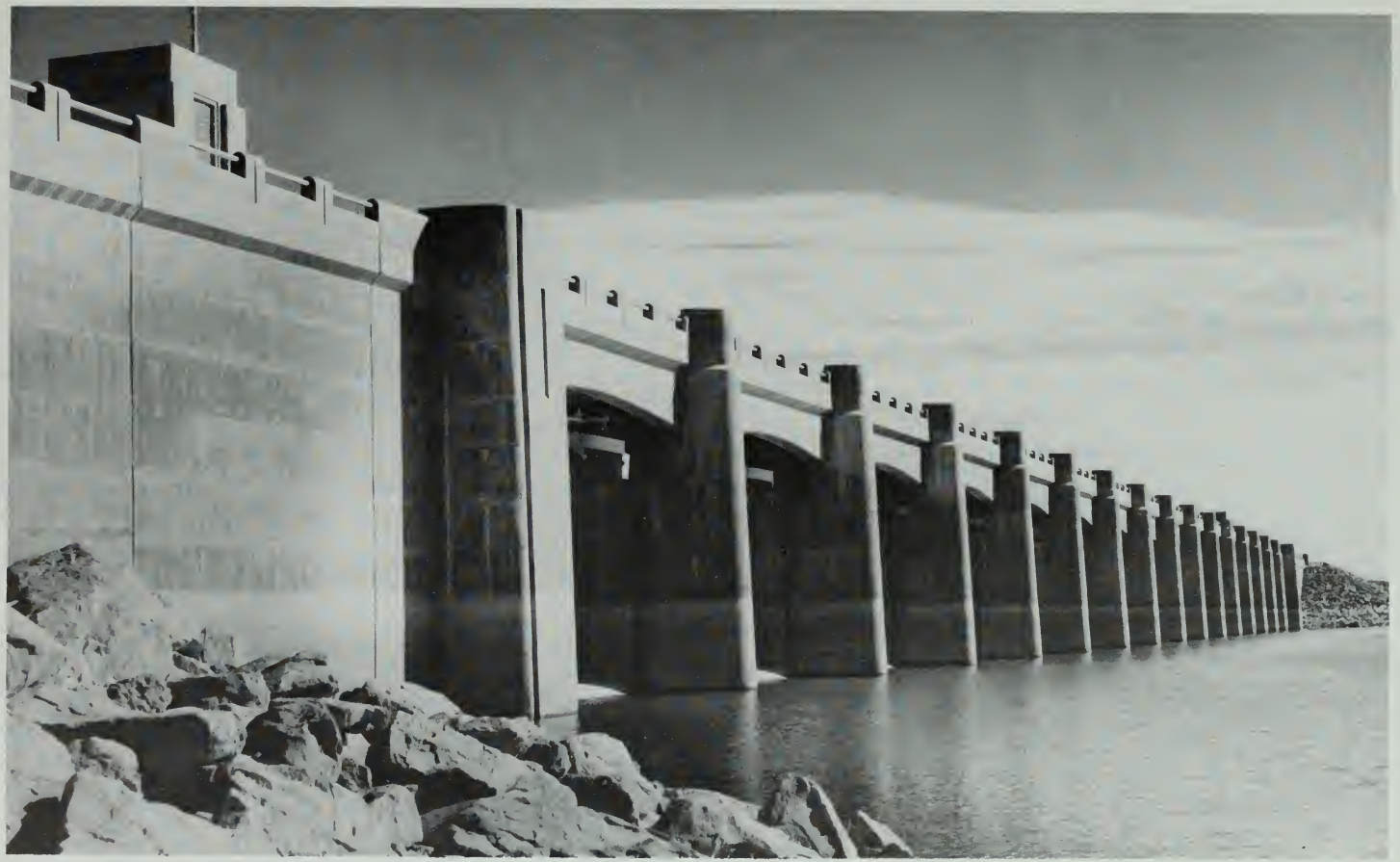


Plate No. 20. Arched Gateway of John Martin Dam

their midst faded as the project rapidly advanced in 1940 and 1941. Because the site contained rights of way for a major railroad line, and established communities were within easy driving distance, the employees of the Corps and the private contractors endured less of the hardships that occurred in New Mexico. To employees familiar with charges of scandal, discrimination, favoritism, and political influence at Conchas, the building of Caddoa Dam seemed almost tranquil.[28]

Not long after assumption of control at Caddoa, the District received word of the death of Congressman John A. Martin. Almost single-minded in his devotion to the project, Martin had died in Washington on 23 December 1939. Political contemporaries remembered him for no other legislation than Caddoa Dam. In a letter to Colonel Eugene Reybold six months before his death, Martin told the Southwestern Division Engineer: "It is going to be the very smallest of my concerns in connection with Caddoa who gets what. Caddoa will be enough for me." Reybold thanked Martin for his support of Caddoa, and of Corps projects nationwide. "No one knows better than I," the Division Chief declared, "just what you have done and what you will continue to do as long as you are a member of Congress." In his honor the Army Engineers inserted in the War Department Appropriation Act of 24 June 1940 the clause renaming the Caddoa project as John Martin Dam and Reservoir.[29]

In 1941 the approach of American entry into World War II threatened completion of John Martin Dam, prompting no small amount of concern among local irrigators. The private contractors retained Arthur C. Gordon as counsel to investigate the intentions of the federal government to halt productions at all western water project sites that year. Gordon approached the new congressman from the Fourth District, Republican J. Edgar Chenoweth, with "an entirely confidential letter" about his mission. The Caddoa Constructors faced termination of operations in 30 to 60 days, unless they gained "some kind of priority." The Army Engineers declined its support, and Gordon recognized the gravity of the situation. "This really has to be accomplished largely through Democratic channels," said the attorney, and because the majority of irrigators and businessmen in the valley were Republicans, Gordon feared for the worst. "I cannot really appear in the matter at all," he lamented, and it "would be a disaster if Caddoa were to shut down at the present time."[30]

While the Army Engineers debated the question of continued operations at John Martin Dam, more pressing issues surfaced in the Arkansas basin. Because of the success of the federal water and program known as the Tennessee Valley Authority, individuals in other regions of the country saw plans and schemes emerge to duplicate that feat. Proponents of such basin-wide activities introduced legislation in Congress throughout the New Deal era to create what pundits called the "Seven Little TVA's." Quasi-public corporations would be formed in all major river basins, including the Arkansas, to plan and implement a wide-ranging series of projects and facilities to improve the economic and social conditions of each region.

Late in 1940 a group of business and political leaders from the lower Arkansas River states joined to support a bill to establish the Arkansas Valley Authority [AVA]. Their goals concerned water projects and the navigational potential of the river in the states of Arkansas and Oklahoma. Because the federal government construed these plans to include all reaches of the mainstem of a river basin, the future of John Martin Dam hinged on the scale of the work anticipated by the AVA. The Colorado segment of the new organization would

have little voice in basin-wide decisions, including the allocation of irrigation waters in the future. In addition, the proposed interstate stream compact between Kansas and Colorado stood in jeopardy, as federal solutions would be imposed wherever the government considered them necessary.

Colorado's conservative legislature and Congressional delegation leaped into action upon hearing of the AVA proposal. Clifford Stone, district court judge and director of the Colorado Water Conservation Board, contacted Senator Edwin C. Johnson to inform him of the meaning of the AVA. "Such legislation, Stone warned, "represents an attempt to wipe out state lines, states' rights in water and its control and subject the entire basin to a creature of federal enactment with extensive powers." Frank Hoag, publisher of the Pueblo daily newspapers, voiced similar sentiments to Representative Chenoweth. The Army Engineers had already declined to build a hydroelectric facility at John Martin Dam, and thus Coloradoans would get nothing from the AVA while the state of Arkansas received ample amounts of federal financing. Chenoweth heard at length from Arthur Gordon on the AVA matter, especially the tenuous nature of the Kansas-Colorado legal dispute. "Unless the water impounded in the Caddoa Reservoir can be used for the purpose of making such a settlement," said Gordon, "all of the current ideas with reference to such settlement will have to be thrown in the waste basket."[31]

The outcome of the two issues facing John Martin Dam in 1941 was the political equivalent of a "draw." The united opposition of the state to the AVA meant its defeat in Congress, sparing Colorado from yet another New Deal scheme perceived as an eastern program to dominate the West. But the changing priorities of World War II led OCE to remove all supervisory personnel from the damsite to Albuquerque in early 1942. Military construction became the primary concern of the new District, and only essential staff remained to direct the work at John Martin Dam. Then on 29 March 1943, came word from Washington to halt all activity at the dam. Eighty-seven percent of the structure had been erected, and the concrete portion of the main dam stood in place. All that remained for postwar attention was installation of the steel crest gates, and the bridge crossing the spillway. The Engineers could store irrigation water behind the dam to a volume of 100,000 acre-feet, leaving room for 165,000 acre-feet of flood control storage. Farmers in the Arkansas valley drew down the entire amount to meet their increase production in wartime, and the District believed that no flood flow would damage the unfinished structure so long as the irrigation requirements continued.[32]

The ditch companies of the Arkansas River had escaped the clutches of the AVA, but Harold Ickes and the water planners in Roosevelt's administration did not surrender easily. In 1944 Congress passed House Resolution 4485, the annual flood control authorization. For the first time the Interior Secretary laid claim to all irrigation waters stored in flood protection reservoirs, and wanted to collect repayment monies to supplement the Reclamation fund. Like Conchas, John Martin Dam had been built with no provisions for repayment. Representative Chenoweth feared that this new ploy signalled the financial ruin of his constituents. He went before the Flood Control Committee of the House, seeking language in the bill to exempt John Martin Dam. Major General Eugene Reybold, now Chief of Engineers, voiced his concern that the competitors of the Corps in western waters, the Bureau of Reclamation, meant to take partial control of the dam. Reybold thus concurred with Chenoweth on the need for special treatment for the site. The committee adopted the Chenoweth amendment giv-

ing Colorado interests protection from the intrigues of Harold Ickes. After this decision, the Army Engineers promoted irrigation in its multipurpose water projects throughout the West, placing the Corps in direct opposition to the Interior Department.[33]

With the end of World War II in 1945, the Albuquerque District returned to John Martin Dam to complete its work. The demobilization efforts of the Army required most of the Corps' attention until the spring of 1946, when on 5 June construction crews arrived at the damsite. By the fall of 1948 the main gates had been installed, and on 13 October the District began filling the reservoir to its prescribed irrigation capacity of 275,000 acre-feet. The Corps contacted Representative Chenoweth, who agreed to organize the dedication ceremonies for the following spring. On 1 April 1949, a large crowd of dignitaries, Corps personnel, and local residents gathered to watch Mrs. John Martin, widow of the Pueblo Congressman, pull a special lever to release irrigation water for spring planting. Lieutenant Colonel Joseph O. Killian, District Engineer, represented the Albuquerque District, and the governors of Kansas and Colorado joined in the speech making. Clifford Hope, Representative from the First District in western Kansas, gave the major address, calling for continued cooperation between the two states on water questions, and hoping for a solution to the decades-old split over the Arkansas River.[34]

While the audience at John Martin Dam celebrated completion of the project, some in attendance already knew of a proposed agreement between the two states over division of the river. On 6 December 1943, the U.S. Supreme Court handed down its second decision pertaining to the Arkansas in *Colorado v. Kansas* [320 U.S. 383]. The original suit in 1907 had satisfied neither party, because Kansas' riparian laws could not force Colorado to cease diversion of the stream while it flowed within that state's boundaries. Yet the historic claims of Kansas farmers meant that Colorado's prior appropriation method had to release certain quantities downstream at the expense of later Colorado claimants. The justices declared that any judicial solution would leave one party aggrieved, and called upon the U.S. Congress to create a compact commission to reach an equitable understanding.

The idea of resolutions of interstate stream controversies with compacts had become a time-honored concept by the 1940s, and the Congress expected an answer when it appointed the commissioners. The vagaries of western water law and the realities of the arid West generated much debate wherever land developers, urban planners, and agricultural interests pressed their claims to the precious resource. The first river basin to undergo this form of regional compromise was the Colorado River. In 1922 commissioners from the seven basin states joined in Santa Fe to agree upon the distribution of its streamflow. Other western rivers underwent similar scrutiny, and the technique of signing interstate compacts had become standard policy by World War II.[35]

The Arkansas Compact Commission met in Denver in 1948 to conduct its proceedings under guidelines established by Congress three years earlier. The governor of Colorado appointed three members to the board, while Kansas sent four individuals. As director of the commission, President Harry S Truman designated Hans T. Kramer, former District Engineer at Conchas and Caddoa Dams. Kramer earned the position through his experience with the Army Engineers, operators of the major water project involved in the dispute, and his knowledge of western water problems. After serving in World War II and achieving the rank of Brigadier General, Kramer retired from the Corps with

a disability. He then established a consulting service to state and local governments interested in building water projects. Kramer counted among his postwar clients the state of California, advising it on water problems in the San Francisco Bay area, and the Army Engineers for its series of dams on the Missouri River.[36]

Because of his forceful personality and grasp of engineering detail, Kramer proved to be an excellent choice for the Arkansas Compact Commission. The fundamental differences between the states required a firm hand, and Kramer provided that and more as the delegates worked their way to a solution. More than once the former military officer felt compelled to "knock heads" when the divisions became too great. From his perseverance, and that of his colleagues, came the decision on 14 December 1948, to settle all claims amicably and allocate all waters of the Arkansas according to a mutually agreeable formula. The two states would form the Arkansas River Compact Administration [ARCA], working closely with the Army Engineers and the local irrigators. All streamflows not required for flood control storage would be released on call by the ARCA, and no new ditch companies on either side of the state line could be formed without commission approval. Congress accepted the compact as written on 31 May 1949, entering its own clause denoting federal superiority in all ARCA matters. After two generations of litigation and discord, the Arkansas valley looked forward to a less-contentious future.[37]

The compact brought a semblance of order to irrigation in southeastern Colorado, but a new problem unforeseen by the negotiators threatened to subvert the work of the previous years. Because John Martin Reservoir constituted the only large body of water for miles in any direction, outdoor recreation interests approached the Albuquerque District to retain enough storage each year to create a permanent pool. The postwar growth of western communities included many individuals with white-collar jobs and increased leisure time. They enjoyed outdoor recreation, especially such water sports as boating and fishing. The majority of residents in the small communities along the Arkansas had their roots in the Midwest, where plentiful rainfall and natural terrain made large pools of water commonplace. Yet when calls for irrigation releases drew down the level of the pool, and often drained it completely, public outcry arose to restore the pool at government expense. Local sponsors of the project found themselves trapped between the needs of a powerful constituency of farmers and ranchers, and the national pursuit of water recreation. Because both groups turned to the federal government for redress, any decision reached would set a pattern for similar conflicts over usage of Corps water projects for the next generation.

The clamor for a permanent pool at John Martin Dam had begun as soon as the streamflow backed up against the unfinished walls in 1943. Less than three weeks after cessation of work by the District, on 10 April the U.S. Fish and Wildlife Service of the Interior Department asked that 10,000 acre-feet of storage be made available for a migratory water fowl refuge. Wartime restrictions tabled this request, but in 1947 the Colorado Game and Fish Department made overtures to the Albuquerque District to implement a plan for hunting and fishing at the reservoir. The Corps recognized the inevitability of such inquiries, and in 1950 set aside funds for construction of recreational facilities. The "borrow pit" for gravel directly east of the dam had filled from the rising ground water table, and the District hoped that this 75-acre tract would satisfy the state.[38]

The plans for the new pool, named "Lake Hasty" for the nearby town, were considered inadequate by local residents. In 1952 the irrigators met at the courthouse in Las Animas to discuss the need for a larger pool behind the dam. Gordon Allott, an attorney representing the Amity Mutual ditchowners, reminded the group that John Martin Dam had been constructed solely for the purpose of water conservation and irrigation. No funds had been allocated for recreational use, nor could local interests afford to maintain such a pool at their own expense. The Arkansas River ran dry in midsummer about 80 percent of of the time, and heavy siltation meant that increased storage endangered future use of the reservoir for peak flows.

The irrigators understood the gravity of Allott's remarks, but also recognized the pressures for recreation at the dam. As an experiment, they authorized the Albuquerque District to retain 1,000 acre-feet of their water on a voluntary basis for use by fishermen and sunbathers. The quantity was insufficient for profitable use, however, and the high rate of evaporation in the arid region meant the end of the ditchowners' efforts.[39]

When the pool ran dry in the summer of 1953, renewed calls for recreation convinced U.S. Senator John Carroll to introduce Senate Bill 1316 on 9 March 1954. Carroll hoped to acquire federal funds to purchase waters for a permanent pool at John Martin Dam. Nothing came of Carroll's bill, but several individuals formed the Arkansas Valley Permanent Pool Association to continue the fight. When the reservoir again stood empty in 1959, the pressures from all sides in the debate mounted. The Colorado Game and Fish Department argued that "the general public paid for the construction of the impoundment and continues paying for its operation." Over 200 tons of carp had perished when the reservoir dried up that year, costing Colorado state fish hatcheries their $25,000 investment. Individuals in the area had purchased boats with an eye towards use on the reservoir, and one summer's day in 1958 saw nearly 10,000 people avail themselves of the waters behind the dam.[40]

By 1960 Gordon Allott had become U.S. Senator from Colorado, and the combatants on both sides of the permanent pool issue looked to him for a solution. Recreation enthusiasts observed that Allott's 20 years as a water lawyer for the Amity Mutual Company colored his judgements on the potential of John Martin Reservoir, and that his caution signalled favoritism for irrigators over anyone else. Stung by criticism in his hometown newspaper, the *Lamar Daily News,* Allott warned its editor that the proposals advanced by outdoor sportsmen were much too simplistic. The Arkansas was badly overappropriated, and the Colorado state constitution held that water was a property right as sacred as land. Allott knew that long and involved court suits awaited any who tampered with that system. The only hope rested with negotiations among the state, the ditch companies, the Army Engineers, and the recreationists. "I believe this can be done," the senator said, "but merely raising the amount allocated for flood control will not accomplish it."[41]

The prophesy of Gordon Allott came true less than four years later, when a combination of increased population in the valley and a massive flood provided John Martin Reservoir with full capacity, and demands of retention of some of the waters. Searching for an answer to the permanent pool question, Representative Chenoweth introduced a bill to that effect in 1963. Allott refused to join his fellow Republican in sponsoring the measure, warning that factors of sedimentation, evaporation, and the views of Kansas irrigators had been ignored in House Resolution 9522. The Arkansas Compact had confronted this

issue of recreation, and had dismissed it as infeasible. Allott feared that any changes meant destruction of the legal authority of the ARCA. Conservation groups such as the Izaak Walton League of America, and the Colorado Wildlife Federation, disagreed with Allott, and cranked up their publicity machines in support of Chenoweth's measure.[42]

While Allott managed to sidetrack the permanent pool question when it reached the Senate Public Works subcommittee, events in 1965 brought the controversy to a climax. In June a series of intense thunderstorms broke out along the Front Range of the Rockies, and in the Sangre de Cristo mountains to the south. A lack of flood protection in Denver resulted in losses in excess of $300 million. Along the Arkansas, however, the presence of John Martin Dam meant that residents below escaped the worst of the flooding. The Albuquerque District estimated that $52 million worth of property would have been lost without the structure. More importantly, the reservoir contained so much water that the tainter gates had to be opened for the first time since construction. The cascading water attracted thousands of sightseers to witness the spectacle, and irrigators who had been denied streamflow allocations in dry years suddenly received their full shares.[43]

Because no one had ever seen the volume of water behind John Martin Dam that existed in the summer of 1965, many people could not believe that it was the Army Corps of Engineers' duty to begin releasing the contents immediately. Demands for new legislation creating a permanent pool resurfaced, this time sponsored by the new Democratic Congressman from Pueblo, Frank Evans. In his successful bid to unseat J. Edgar Chenoweth, Evans availed himself of the long coattails of the highly popular president, Lyndon B. Johnson. By subscribing to the social programs of LBJ's "Great Society," Evans felt compelled to seek out issues benefiting his constituency of urban voters. Among his campaign promises had been the permanent pool idea, and Evans wasted no time in attaching such an amendment to the Omnibus Public Works bill for 1966.[44]

The popularity of Evans' legislation became apparent in the fall when several Arkansas valley newspapers voiced support for the Congressman, and chided their longtime Senator for his truculence. The Albuquerque District stood behind the pool request, as did the Board of Engineers for Rivers and Harbors. To combat the groundswell of opinion, Gordon Allott began contacting influential colleagues with an interest in the issue. Robert Dole, the young Republican Congressman from western Kansas, agreed with Allott that the Arkansas Compact stood in jeopardy. "The State of Kansas," he informed the House Subcommittee on Public Works, "is vitally concerned with any changes adverse to the best interest of Kansas residents."[45]

Allott's strongest endorsement, however, came from his New Mexico neighbor, Senator Clinton P. Anderson. Anderson chaired the Committee on Aeronautical and Space Sciences, and had served on the Interior Committee since his arrival in the Senate in 1949. Considered by many to be one of the most able legislators in that body, Anderson's vote carried considerable weight in matters affecting western waters. Anderson wrote to Pat McNamara, chairman of the Senate Public Works Committee, to warn him of Evans' bill, and of the Congressman's attempt to bury House Resolution 7162 in the Senate legislation so as to avoid public hearings. "We have trouble constantly," said the former Secretary of Agriculture, "with the effort to create these permanent pools which may upset the people who depend upon irrigation for farms along the

river." Anderson did not reject the idea of a permanent pool at John Martin Reservoir. He merely asked McNamara for more time to conduct hearings in the Arkansas valley to gauge the temper of its residents.[46]

Despite the last-minute appeals of Gordon Allott, the Evans proposal met with success in the House-Senate Conference on the Public Works bill. It then became part of the $2 billion appropriation act for 1966. Public Law 89-298 authorized the Chief of Engineers to utilize "no more than 10,000 acre-feet of flood control storage space for fish and wildlife, and recreational purposes." The Albuquerque District agreed to apportion the water when the reservoir level permitted. It also entered into an agreement with the Colorado Game and Fish Department to supply and stock the pool on a regular basis.[47]

In the end neither side received quite what it expected from the permanent pool debate. Recreation enthusiasts could anticipate use of the reservoir for longer periods of time, without concern that the pool would be drained capriciously. Yet irrigators did not sacrifice any of their shares of water, because the overapporpriated stream still needed every drop for storage. John Martin Reservoir stood empty as late as 1982, at which point the state of Colorado purchase 10,000 acre-feet to store behind the dam. But in the never-ceasing battle over rights to the river, that allocation also underwent court challenges.

By the 1980s, however, water users in the Arkansas valley had agreed to a change in distribution methods of the stream. In the past when a farmer called for his daily allocation, the Corps released everyone's water whether needed or not. This wasteful practice stemmed from fears that constant drawdowns would leave individuals without any water at all. After 1982 the users consented to have the Albuquerque District release only that portion needed by any one farmer. This allowed retention of more surface acreage in the reservoir, and defused the recreation pool debate to some extent.[48]

When the Albuquerque District left the worksite of John Martin Dam in 1943, it had experienced eight years of planning and construction in the Southwest. The Conchas and Caddoa Districts had encountered innumerable problems of logistics, personnel, litigation, and public scrutiny as its multipurpose facilities took shape. Because of the temporary nature of each District, and because World War II consumed all the energies of the new Albuquerque District, few individuals could afford the luxury of contemplation over lessons learned, and situations to avoid in the future. When the postwar boom in western construction gained momentum in the late 1940s, this inability to reflect on past achievements would cause the District to confront similar circumstances.

In hindsight, the Albuquerque District could not have known how crucial its presence in the Southwest would become. The political leaders of New Mexico saw a gold mine in federal appropriations, if only they could justify the expenditure of federal funds on water projects. The successes of Clyde Tingley and Arch Hurley were not lost on the like of Carl Hatch, Dennis Chavez, and Clinton Anderson, who would continue the practice of increasing the federal presence within the state as the only means of augmenting the standard of living. Succeeding generations of political leaders learned to protect these investments, seeking out choice committee assignments in Congress or volunteering the state for new projects that would meet growing opposition as time progressed.

As for the relationship between the District and Colorado, the bulk of the population growth occurred in the northern reaches of the state. There the river basins came under the purview of the Omaha District. But historical factors

that tied New Mexico ever closer to the Corps and the federal government did not exist in Colorado. The political hierarchy expressed support for balanced budgets and reduced federal expenditures. When the state did request water projects, they were irrigation facilities built by the Bureau of Reclamation. Among these were the Colorado-Big Thompson and Frying Pan-Arkansas diversions projects. In the meantime the pressures of war in Europe gave the Albuquerque District a new role to play, as the government called upon the Corps and the region to participate in the war effort in a variety of ways.

IV

WORLD WAR II

In his book, *The American West in the Twentieth Century,* Gerald D. Nash holds that the year 1941 marked a turning point in the fortunes of the western United States. For most of its modern history, the state of New Mexico languished in the shadow of more populous and wealthy regions of the Northeast and Midwest. Unable to finance its own public works projects, and possessing too small a population base to create a thriving economy, New Mexico survived by means of tourism, federal social programs, and small amounts of agriculture. All this would change as the Japanese attack on Pearl Harbor stimulated a rapid expansion of military activities nationwide. The impoverished Southwest underwent an economic and social revolution of staggering proportions, and the Albuquerque District would operate as a prime mover in this new age of technology and militarization.[1]

When Clyde Tingley devoted his summer of 1935 to cross-country train rides in search of federal funding for Conchas Dam, little did he know that Hitler's and Hirohito's expansionistic policies would accomplish what he could not: a technical and financial windfall for the state that he governed. When the Board of Engineers for Rivers and Harbors ruled in 1931 that the price tag for Conchas exceeded its merits, they could not foresee the day when the $15 million water project near Tucumcari would pale in significance to their quarter-billion dollar operation in the Albuquerque District from 1941 to 1945. By war's end, the District would be engaged in military construction from Garden City, Kansas, to Flagstaff and Tucson, Arizona, and from Abilene, Texas, to Pueblo, Colorado. The story of that explosive growth, and of the reverberations through the social and economic fabric of the Southwest, explains the important role the Albuquerque District has played in shaping the region and why the Southwest is now on the leading edge of change in 20th century America.

By 1940 the Army Engineers had accomplished most of its original tasks emanating from the Depression and New Deal years. Conchas Dam stood ready for use, and the construction crews at John Martin Dam were hard at work preparing that project for completion. The Office of the Chief of Engineers had decided to maintain a district office in the Southwest on an interim basis, and devised plans to transfer all studies of the Rio Grande and Pecos River basins to the Caddoa district. The Roosevelt administration, however, had determined that the U.S. would move towards military preparedness, and word went out to the Caddoa office to take over construction of municipal airfields in the surrounding area. These included La Junta, Colorado, Dodge City, Kansas, Amarillo, Texas, and the following New Mexico locations: Santa Fe, Las Vegas, Hobbs, and Clovis. The District replaced the Civil Aeronautics Administration in this regard, and changed the nature of these airstrips by lengthening and adding runways, paving the parking pads, and installing additional runway lights and markers.[2]

The deteriorating fortunes of America's long-time allies in Europe, France and Great Britain, convinced the federal government to escalate the pace of military construction nationwide in 1941. Because of a strong movement of isolationism and "America First" sentiment, the President moved cautiously into the area of defense preparations. In addition, the government realized that superior air power was the only way to negate the successes of Germany on the Continent or of the Japanese in the Pacific and Far East. Therefore the Army Engineers received orders to prepare more airfields for potential military use.[3]

By October 1941 the Caddoa District had detailed personnel to Lubbock, Texas, Roswell and Albuquerque to construct new air facilities. The Army had leased 2,000 acres south of Albuquerque for such work in 1939, and began construction of the future Kirtland Air Force Base in January 1941. The Albuquerque Army Air Field soon filled with bomber crews from around the country, attracted by the clear air, high altitude, mild climate, and open space away from densely populated urban centers. The Lubbock site later became known as Reese AFB, while the Roswell location was named Walker AFB.[4]

Throughout the last year of American neutrality in the war, the Caddoa District mobilized for a series of missions that it could only faintly comprehend. Many individuals suspected that the country would enter the conflict on the side of the Allies. The question was when and to what extent. The District conducted tests at the Lubbock airfield to determine a suitable runway, without any knowledge of the size or weight of the planes that might use it. The District also engaged in planning for military roads within the region. Whenever a community heard of tentative proposals for upgrading its highways, it pressured the Corps for details that remained classified. One example was the appeal from the U.S. Potash Company, near Carlsbad, for the District to build bridges and pave roads between its mines and the national highways in southeastern New Mexico. Horace M. Albright, Vice-President of U.S. Potash, reminded the District that foreign sources of his commodity had dried up, and that the defense of the nation required an uninterrupted flow of potassic minerals.[5]

When the Japanese attacked the U.S. Pacific Fleet in December 1941, the District and the nation were both shocked and somewhat relieved. The casualties staggered the imagination, but a sentiment quickly emerged of grim determination to put the country on a course for total victory. The Army removed its official military construction program from the Quartermaster Corps to the Engineers on 16 December, to take advantage of the talents of an organization that had engaged in large public works projects. The OCE also redrew all district boundaries to reflect more closely the eight military divisions of the country. Caddoa received the southeastern portion of Colorado, western Kansas and Texas, all of New Mexico, and all military ground forces construction in Arizona. One week later OCE ordered the District offices transferred to the city of Albuquerque, a more centralized location for communications and transportation. The Corps also renamed the District for its headquarters city, and sharply curtailed all of its civil works functions.[6]

The pace at which Major Lyle Rosenberg, the newly appointed District Engineer, required his staff to transfer from John Martin Reservoir to their new location typified the level of activity experienced by the District for the duration of the war. Although official orders from Washington arrived only two days before Christmas, Rosenberg informed his section chiefs to submit plans for relocation in two weeks and to implement them by 10 January 1942. Somehow the District contracted with moving companies, leased office space, compiled lists of

available housing, and transported personnel and equipment a distance of 400 miles in the middle of winter over treacherous mountain roads. Employees selected apartments and homes from master lists sight unseen, and were ready to report to work by mid-January.[7]

Even as the Albuquerque staff organized for the move from Caddoa, it learned of the scale of its new assignment and how that assignment would dwarf its previous work at Conchas and John Martin Dams. Lieutenant Reuben E. Cole, Construction chief and later Engineer for the District, returned from a trip through Arizona on 30 December 1941, and reported the need for military construction at Fort Huachuca, Belmont, Phoenix, and Tucson. Outside Florence, an Arizona mining town of 2,000 people, the Army planned a 7,000-man training camp on 40,000 acres of land. OCE also ordered the District to locate and construct a major weapons storage depot in the mountains near Flagstaff. The Corps transferred this project from its Western Nevada Area Office to Albuquerque, along with its price tag of $18 million. Neither Conchas nor John Martin Dams had required such capital outlays as this one contract, and soon projects many times greater would flow through the Albuquerque District at the rate of nearly two per week.[8]

Once in Albuquerque, the District wasted no time in recruiting staff members and seeking out contractors. The recently promoted Colonel Rosenberg selected as headquarters the Simms Building, a three-story structure on the corner of Fourth Street and Gold Avenue. As the number of employees grew to an eventual 3,000-plus, other offices in the downtown area were rented, making coordination of activities difficult. The competition for trained engineers, scientists, and support personnel increased as all regions of the country sought the best minds and workers to meet war time obligations. Adding to the burden was the blizzard of paperwork spewing forth from the various federal wartime boards and commissions. The University of New Mexico had a student body of less than 2,500, and the hiring away of college faculty to work in defense projects made training of technicians in the Albuquerque area more problematic.[9]

Despite these obstacles, the District filled its ranks with qualified personnel in time to handle the ever-growing work load in the Southwest. On 1 January 1942, Albuquerque took control of military construction at Fort Bliss, in El Paso, Texas, the largest Army base in the country. With this acquisition came the need to construct Biggs Airfield adjacent to Bliss, and then a series of smaller fields in Deming, Carlsbad, and Hobbs. Each base had a host of satellite airstrips for practice runs — 21 in the Deming area alone — and the Hobbs location included sites as far away as Pyote, Marfa, and South Plains, Texas. The Albuquerque District also constructed flight schools as airbases for the British Royal Air Force, whose training facilities had been destroyed in the German bombing raids of 1940. These centers included Lordsburg and Las Cruces, Wink, Texas, and Dodge City and Garden City, Kansas.[10]

In its haste to erect bases, depots, camps and training sites, the Albuquerque District would suffer from the same problems afflicting the nation as a whole in wartime. All social and economic considerations deferred to military construction and defense work, and the pressures of growth had to be borne irrespective of the consequences. Difficulties fell into two broad categories: technical and personal. The District cast about for solutions to construction and engineering questions it had never before encountered, while the hardships of boom growth in the region were addressed whenever the District could divert its attention from its primary tasks. In the process the Albuquerque District

gained knowledge that aided in the fulfillment of its missions, and revealed the idiosyncrasies of life in the Southwest during the stress of war.

A critical issue facing not only the Albuquerque District but all other Corps institutions engaged in airfield construction was the correct method of building and maintaining runways. Defense contractors speeded up delivery of larger aircraft as the war progressed, requiring resurfacing of airstrips every few months. In the Southwest, the qualities that made for perfect flying weather also meant large amounts of blowing dust, and a lack of rainfall or pools of water with which to control the dusty runway conditions. Added to this was the fragmentary nature of data on general airport design and maintenance. To overcome these problems and other handicaps nationwide, the Corps selected a former Caddoa District Engineer, Lieutenant Colonel James H. Stratton, as chief of the Engineering Branch of OCE in Washington, to formulate runway plans.

Stratton received this important and challenging assignment for several reasons. His career encompassed military leadership and a thorough grounding in engineering science. The 43-year-old Colonel had served in Panama, and joined the Civil Works Division of the Corps in 1933. Under the strict tutelage of Hans Kramer at Conchas Dam, Stratton learned the art of desert engineering, and led the technical forces in building the Corps' first Southwestern water project. When Captain Kramer received transfer orders to the Panama Canal in late November 1939, Stratton assumed full command at Caddoa, where he remained until the outbreak of the war.[11]

While at Conchas and Caddoa, Stratton engaged in two activities that would propel him to the top echelons of Corps leadership in Washington. In 1938 he delivered a scholarly paper to the Boston Society of Civil Engineers that demonstrated his grasp of soils engineering and concrete construction. Then in 1941 he applied his techniques to the construction work at Lubbock field, utilizing asphalt laid over the natural caliche base to create a surface capable of withstanding heavy loads. The Chief of Engineers ordered Stratton to Washington to perfect his methods as quickly as possible, as over 100 airstrips awaited the results.

After two years of intense experimentation, Stratton and his staff of Corps employees and academicians announced the success of their efforts at the 1944 meeting of the American Society of Civil Engineers. Stratton's innovations were hailed as a breakthrough not only for the military, but for postwar commercial aviation as well. Critics outside the Corps wondered about Stratton's empirical approach and rapid succession of tests, but the American domination of aerial combat throughout the world testified to the contributions of Stratton and the Corps. The magazine *National Aeronautics* went so far as to predict a rosy future for air travel after the war because of the strengthened runways, and Stratton received a promotion to General Dwight D. Eisenhower's command in England for his accomplishments.[12]

The challenge of wartime construction of airstrips in the Southwest provided only one of the many tasks the District encountered in fulfillment of its military mission. Thousands of workers and their families descended upon small towns in the region, creating overnight pressures for housing, schools, health care, sanitation, and other social amenities. In addition to this growth, the District also faced critical shortages of labor, violations of the "no-strike" agreements sought by the Roosevelt administration, and a lack of building materials. Then the old nemesis of sparse rainfall forced the District to design imaginative methods of supplying water to desert locations that tripled and quadrupled in

size, with no appreciable increase in their sources of water. The city of El Paso reminded the District Engineer that any new deep wells to supply Biggs Airfield and Fort Bliss endangered that community's future. Should the District discover new pockets of groundwater, however, El Paso would finance its own water softening plant to help meet the growing demand.[13]

Because the need for rapid construction required access to major transportation lines, the communities in the District that benefited most were along the transcontinental railroad routes of the region. Deming, Carlsbad, and Clovis all experienced phenomenal growth as a result of their good fortune. Yet these cities also stretched thin their delivery of goods and services to natives and newcomers alike. Clovis feared that its 40-bed hospital would be swamped when several thousand construction workers appeared. Schools overflowed with pupils, and sanitation was not a priority for many newer citizens. To meet these and other concerns, the Albuquerque District contracted with a host of companies to deliver food, fuels, clothing, and utilities to the employees at its construction sites.[14]

Despite the work of the Army Engineers, the task of supporting the concentrations of war workers soon overwhelmed many locales in the District. Crews building the airfield in Clovis could not maintain full strength because people could not find housing within a reasonable distance. Clovis had no municipal transit system, and the rationing of gasoline for passenger vehicles severely limited the radius of commuter traffic. Those who did secure housing paid exorbitant rents, often for substandard facilities shared by several families. A. W. Anderson, secretary of the Clovis Chamber of Commerce, estimated that 1,000 persons had no permanent dwellings by December 1942, and he feared that plans to station 6,000 enlisted men at the completed airfield would overwhelm an already critical situation. Anderson placed the blame for the "Clovis tragedy," as he called it, squarely on the shoulders of the Albuquerque District, and demanded highest priority for Clovis in the District's planning.[15]

If the airbase towns of the Southwest labored under the strain of new growth, the arrival of thousands of people from other parts of the country shook the social foundations of the region to its roots. The Southwest had a strong reputation as a non-union area, and the federal government relied upon this fact when channeling employment into the District. Liberal wage and benefit clauses in government contracts nationwide were meant to reduce the temptation to strike and limit delivery of war materiel. This generosity caused problems in the Southwest, however, as local contractors disliked paying 50 to 60 percent higher wages than prewar standards. Several construction managers feared that Southwestern laborers would not return to the old pay scales when government contracts ended. Worse than wage rates was the influx of labor organizers who disregarded federal stabilization agreements in their quest to form unions in the growing industries of the Southwest. The Albuquerque District and the Southwestern Division of the Corps gained notoriety for their high percentage of work stoppages and grievances filed against both unions and management.[16]

Of all the social tensions in the District, none pointed out more the transitional nature of the Southwest in the war than the need for segregated housing at airbases and work camps. The state of New Mexico had, in the person of Dennis Chavez, the only Hispanic U.S. Senator ever to serve in that body. Construction crews in northern New Mexico numbered hundreds of Pueblo Indians, while Navajos filled the ranks at Fort Wingate Army Depot near Gallup. Yet,

the U.S. Army in wartime New Mexico retained the racial divisions between blacks and whites that had existed in the military since its founding.

In their desperation to meet construction deadlines, or provide workers for menial service tasks in the Southwestern boomtowns, contractors lured hundreds of black men and women to Clovis, Deming, and other towns. Clovis had experienced racial paranoia in early 1942 when the twin shocks of Pearl Harbor and the capture of the New Mexican National Guard contingent on Bataan Peninsula led the citizenry to demand the ouster of 20 Japanese railroad workers from the Santa Fe rail yards. The appearance of black jobseekers proved every bit as unnerving, and community pressure forced the District to build at extra expense a series of trailers and houses for the blacks. When reports surfaced at Deming that black employees of military contractors suffered from abnormal rates of venereal disease, the resident manager had to request additional funds for an all-black health clinic.[17]

Despite these hardships, most communities in the region either tolerated the presence of the military or avidly sought its favor. The federal government expressed concern over the heavy concentration of industry and business in the more populous East, as this made the nation's war work more vulnerable to sabotage and attack. The War Department suggested the creation of five "interior zones" of open space, underemployment, and limited productivity, to receive large amounts of defense appropriations. Responding to this situation was the Chamber of Commerce of Raton, New Mexico, which wrote to the New Mexico Congressional delegation and state officials to encourage what it called the "Sell New Mexico Campaign." The coal mines in the Raton area either stood idle or operated on reduced schedules, and the town needed assistance to replace the phased-out New Deal social programs. Ignoring the harrowing experiences of Clovis, the Chamber touted Raton's climate, geography, natural resources, and its position at the center of a proposed "defense triangle" between Denver, Albuquerque, and Amarillo. The campaign went for naught, however, and Raton endured the war years without any significant increase in expenditures of federal funds.[18]

During the course of the war, the Albuquerque District engaged in dozens of construction projects that fell under the category of "top-secret" or "highly classified." While every facility could claim some connection to national security, three activities in particular stand out as indicative of the nature of such projects. These included the building of Japanese internment camps and prisoner of war sites, the Zia Project to support Los Alamos, and construction of the "Trinity" test site for the detonation of the first atomic bomb. In all three cases the District had no role in policy making, but merely followed orders dispatched from Washington. The Los Alamos project left all parties in the dark, so that the sensitive nature of the experiments would not be compromised. Four decades later, students of history still debate the consequences each task had for the Southwest and the nation.

The tale of the prisoner of war and internment camps had its roots in two related events: the need for secure facilities to house large numbers of enemy soldiers captured in Europe and the Pacific, and the wave of fear that descended over the West Coast after the bombing of Pearl Harbor. Few citizens disputed the merits of prisoner of war camps, and the isolated conditions of the Southwest caused the army to build several detention centers throughout the District. Camps for German and Italian troops sprang up in Roswell, Lordsburg, Albuquerque and Las Vegas in New Mexico; Trinidad and Monte Vista in Col-

orado; and Florence in Arizona. Once the Albuquerque District had erected housing, barbed wire fences, and support facilities, it turned over operations to the military command in San Antonio, Texas, but still provided maintenance and repair functions when needed.

In general these prisoners were well-treated by the local communities, especially when camp commanders "rented-out" the strong young soldiers for farm labor. Sugar beet growers in the San Luis Valley of southern Colorado were desperate to replace Hispanic workers lost to the higher-paying wartime employment of the cities, and hired squads of prisoners from the Monte Vista camp to help with the harvests. Germans held at Walker AFB in Roswell became good friends with their captors, and suggested to their superiors upon returning to Germany that Luftwaffe pilots be trained in the Southwestern deserts. Fort Bliss still accommodates such visitors each year, and the city of El Paso has a large German contingent dating back to the days of the war.[19]

In the case of the Japanese, however, the construction of internment camps struck a more troubling note. For several generations the Japanese and other Asian peoples had emigrated to the western United States in search of work and to escape from unstable conditions in their home countries. In this regard they mirrored the waves of Europeans to the United States who totalled 35 million immigrants from 1860 to 1920. The Japanese had little political clout, different cultural and linguistic backgrounds, and often did not enter the mainstream of society as did the Europeans. Political and civic officials in the West reacted negatively to their presence when the United States and Japan declared war on each other, leading to a series of incidents culminating with the incarceration of Japanese-American citizens in the desert Southwest.

At first the public outcry against the Japanese consisted of calls for surveillance and denial of employment in defense industries. But long-standing racial animosities on the West Coast led authorities to demand removal of all Japanese, citizen and alien alike, from the populated areas for fear of sabotage. Such action constituted an abridgement of their civil rights. But pressures to speed the war effort and avoid discontent among citizens who were asked to sacrifice heavily overcame the better judgement of politicians from California to Washington, DC. In January 1942, President Roosevelt signed an executive order creating the War Relocation Authority, directing the U.S. Army to monitor the removal of all Japanese residents to camps located in the intermountain West.[20]

Within months the Albuquerque District added the construction of Japanese internment camps to their already crowded schedule. The sites in New Mexico and Colorado never attained the notoriety of Camp Manzanar in Death Valley, California, but their low priority in the District's scheme of work created conditions many regarded as unpleasant and degrading. Scarce materials resulted in temporary dwellings that failed to protect against the extremes of desert heat and cold, and the shortage of workers caused the District to press into service the internees themselves. Granada, Colorado, was built in this fashion, as was a camp settlement on the southwestern edge of Santa Fe. By late 1945 all detention camps had been closed, and the District demolished the structures as part of its postwar demobilization effort. The legality of such behavior remained for the courts and history to decide. Forty years later the Japanese camps of the Albuquerque District live on only in memory.[21]

More permanently etched in the minds of New Mexicans were the activities of the District at Los Alamos and the Trinity site. At both locations the Army



Plate No. 21. Marker for Trinity Site, Alamogordo Bombing Range, New Mexico



Plate No. 22. Personnel of Zia Project Office, Santa Fe, New Mexico

Engineers joined with world-renowned physicists, scientists, as well as construction workers to usher in what proved to be the most dramatic and forbidding age of United States history: the development and proliferation of nuclear weapons. Although the District maintained a very low profile in northern New Mexico prior to the testing in 1945, without the support of Albuquerque District the "crash program" to beat the Germans to the bomb would likely have failed. Historians debate the wisdom of its use, and the subsequent decades of the "Cold War" and "detente" in foreign affairs have drawn inspiration from the destructive power of atomic warfare. Yet none of these concerns mattered in 1942 when OCE created the Manhattan Engineering District to advance the work of scientists towards construction of an operable atomic weapon.

Under the direction of the legendary Colonel [later Major General] Leslie Groves, Manhattan coordinated projects from Oak Ridge, Tennessee, to Hanford, Washington, to Los Alamos, New Mexico. Of these three, the most critical was the New Mexican facility, where the design and engineering phases occurred. The usual wartime pressures for haste and secrecy were stretched to their limits. The result was an accomplishment that remains highly dramatic years after its completion.

As the Engineer District in closest proximity to Los Alamos, Albuquerque played a vital part in construction and support of the "Atomic City." Every logistical problem encountered by the District multiplied exponentially when related to Los Alamos. Seven thousand people were located in a remote and isolated corner of the Jemez mountains. Included were some of the most famous [and eccentric] scientists and engineers of the day. Residents politely labeled living conditions in Los Alamos as "austere." The strict security measures and constant pressure to achieve a miracle of modern science led many project workers to doubt the sanity of their employment. It was not until the explosion that lit up the morning sky on 16 July 1945, that most residents understood the meaning of Los Alamos and their part in its work.

Dr. J. Robert Oppenheimer, the chief civilian on the Manhattan Project, chose the 54,000-acre site for the complex of buildings and laboratories. A professor of physics at the University of California, Berkeley, Oppenheimer was considered the premier nuclear physicist working for the federal government. Oppenheimer remembered spending time as a youth camping with his family near the elite Los Alamos Ranch School, and of the empty lands surrounding the boys' preparatory facility. When Major John Dudley suggested locating the atomic laboratory near Jemez Springs, New Mexico, Oppenheimer demurred. The steep-walled canyons above the Indian pueblo of Jemez were susceptible to flooding. The projects' highly paid staff would reject the meager housing available in the area, and would succumb to what Oppenheimer called "claustrophobia." The physicist preferred the open vistas of the east face of the Jemez range, which offered easier access to Santa Fe and Albuquerque.[22]

Given word to proceed with the land purchase by Groves and Oppenheimer, the Albuquerque District began work on one of the most challenging tasks in its history. Colonel Rosenberg formed an Area Office in the historic Sena Plaza of Santa Fe to manage all aspects of Los Alamos. The code name "Zia" had derived from the religious symbol of Zia Pueblo for its syncretic blend of the Catholic crucifix and the rays of the sun. Within weeks the District had negotiated a purchase agreement with Ashley Pond, the owner of the Los Alamos school. The agreement included permission for the fall semester to conclude while construction got underway. By the end of 1942 the M. M. Sundt Company of Tucson

received a contract to erect the scientists' dwellings and offices. The District required Sundt to complete the work by May 1943, establishing a pace of construction that did not cease until war's end.[23]

The Zia Area Office quickly became the busiest project for the Albuquerque District. Every piece of paper in and out of the Santa Fe center carried a "secret" stamp, and each of its 50 employees received the highest security clearances. All personnel remained in the capital city, because restrictions on traffic to and from Los Alamos multiplied as the project developed. Nearly all goods were deposited in Santa Fe for transshipment to the site in the Jemez mountains, and transportation between the area office and Los Alamos passed over a treacherous mountain road that had been an unimproved Park Service thoroughfare.

In Los Alamos the District and its contractors faced bewildering changes of schedules and design from both Manhattan officials and the scientists themselves. Among the most critical problems was a lack of water, endangering all activities within the compound. An old Pueblo legend contended that the spirits of the dead in the surrounding area disliked the presence of non-Indians on sacred land, and thus played havoc with the snowfall and spring water. Sundt and Company were asked to overcome the obstacle with construction of a patchwork pipeline six miles below the camp. When the faucets were turned on, said residents, the line leaked "like the fountains of Versailles." Despite the continuing water crisis, the project moved forward with no major improvements to the water supply until after the war.[24]

Because the Los Alamos site rests at 7,300 feet above sea level and is located on the wetter east side of the Jemez mountains, the perils of construction did not end with the twisting mountain roads. The winter of 1942-43 saw very little snowfall, resulting in scant runoff in the spring and fire hazards all summer. The dry weather did permit the Sundt Company to push its work force to meet General Groves' deadline, requiring 14- to 16-hour days for weeks on end. To revive the flagging spirits of construction crews, District Engineer Reuben Cole replaced the Sundts with J. E. Morgan and Sons, and Robert E. McKee, both of El Paso. Morgan's concern would build a brace of apartments for the growing number of families at Los Alamos, while McKee and Company put up a small explosives plant at the "S" site, one mile north of the complex. Both companies worked with design plans prepared by Willard C. Krueger and Associates of Santa Fe.[25]

The change of personnel did not hamper the pace of work at Los Alamos, but the climate of northern New Mexico created great hardships in the winter of 1943-44. Temperatures fell to minus 28 degrees in mid-January, and three feet of snow blanketed the compound. Over the next 60 days an additional two feet of snow accumulated, and construction crews devoted hundreds of manhours to its removal. The chill did not leave the air until summer, and the high snow drifts remained until July.

As challenging to the Albuquerque District as the weather were the labor crews from the nearby Pueblo villages. The original construction workers gladly accepted employment in Santa Fe when the District sought contract bids for building the Bruns General Hospital south of town. This meant that only Indian and Hispanic farmers remained as candidates for work at Los Alamos. Groups of Navajo, Jemez, and San Idlefonso people accepted work with Sundt, Morgan, and McKee, and performed creditably. The non-Indian project managers, under constant pressure to meet deadlines, complained about the penchant of the In-

dians to leave the work site to attend their traditional religious feasts. Said John Sundt: "No sooner would one group return from the Corn Dance than it would be time for the Antelope Dance of another group." Somehow workers and managers combined to build the facilities while still retaining the ancient native practices intact.[26]

Once the bulk of the construction had ended, General Groves made the decision in early 1944 to close the Los Alamos compound to all outsiders. Mail was censored, telephones tapped, and guard dogs circled the perimeter of the barbed wire fences to frighten away the curious. The work of the Zia Project Office came to an end, and in May 1944 the offices of the Santa Fe facilities were terminated. What construction work remained proceeded under the direction of the Manhattan District, with Robert McKee as the sole contractor. The Albuquerque District would not remain apart from the work of Los Alamos, however. In September 1944 the District joined with the Manhattan Engineers for the final phase of the atomic mission: construction of the test site for the nuclear weapon at the Alamogordo Bombing Range.[27]

Upon receiving orders from Manhattan to manage construction of the Trinity site, the Albuquerque District faced a series of obstacles that both paralleled and surpassed its work at Los Alamos. Instead of mountainous terrain, Alpine climate, and proximity to populated areas, the Army Engineers confronted the heat and immensity of the southern New Mexico desert. Like the Zia Project, haste and productivity would be the bywords for Trinity. The District would transform an area known to the early Spanish explorers as the "Jornada del Muerto" into a location housing hundreds of scientists, engineers, technicians, and laborers. The completion of their tasks within two months, at a cost of $5 million, would permit the new President, Harry S Truman, to order detonation of nuclear bombs over the Japanese cities of Nagasaski and Hiroshima. The Second World War, whose Pacific theatre remained in doubt until the day of the atomic test, would suddenly end, replaced by a new and more complex world of nuclear power.

The Albuquerque District and the Corps were no strangers to the desolate stretches of the Alamogordo Bombing Range in 1944. The Topographical Engineers had surveyed the route from Santa Fe to El Paso in the 1850s. Wagon roads and a scattering of military posts became part of the desert landscape upon completion of the Topographers' work. But a lack of technology, and the presence of several bands of Mescalero and Gila Apaches kept settlement to a minimum. By the early 1940s the only permanent residents of the vast area were cattle ranchers who grazed their herds on land leased from the state of New Mexico and the federal government. The scarcity of water and forage meant limiting the size of these herds to one or two animals per one square mile of land. But the low cost of the leases allowed for a small profit in a state with few choice public grazing lands in its southern reaches.[28]

As for the Albuquerque District, it had familiarized itself with the region in two ways. The heavy schedule of military construction included building airfields and landing strips over much of the bombing range. In addition, the District served as purchasing agent for all real estate transactions by the Armed Forces in New Mexico. In that capacity the Corps had traversed much of the ground where a test site could be located. Despite this expertise, two factors surfaced to delay selection of a site and endangered the success of the nuclear program.

Before selection of an actual location for the test, the Albuquerque En-

gineers confronted persistent opposition to acquisition practices in southern New Mexico. Other regions of the state encouraged the Army to locate its facilities nearby, so as to reap the expected economic and social windfall of a steady federal income. The stockmen of the Tularosa Basin, however, disliked the rapid pace of District negotiations over leasing their lands. They also noted the allegedly vague "option to purchase" clauses that led signatories to balk at acceptance. Public meetings on the expansion of the Alamogordo bombing range brought forth strongly worded statements on all sides. C. L. Knight, chairman of the Mesilla Valley Chamber of Commerce, wired New Mexico Governor John J. Dempsey that the Albuquerque District threatened to condemn over 500,000 acres of grazing lands, and that "interested people [were] denied representation at [the 1943] hearing by the Army Corps [of] Engineers."[29]

The point of departure for many residents of the area was not the District's request for additional land, nor the brusque manner exhibited by the agents of the federal government. R. G. Walker, Chairman of the Otero County Board of Commissioners, expressed the sentiments of many in October 1942 when he informed Governor Dempsey that the District planned to "take over the entire southern part" of the huge country for the proposed Guadalupe Gunnery Range. Otero County's operating revenues came from its stockmen, whose grazing permit fees trickled back to the county seat via the state legislature. The country already had Fort Bliss as a federal neighbor, and the 250,000-acre Mescalero Apache reservation added nothing to the local tax coffers. "Otero county will be ruined if this [latest] area is removed," the commission chairman warned. "We do not feel," Walker concluded, "that the addition of all of the southern part of Otero county is necessary in any way for a gunnery range or any other kind of range."[30]

For several months in 1943, opposition to the Alamogordo and other land acquisitions jeopardized whatever plans the Army Engineers had for the region. The District returned to the area in January 1944 to ameliorate the situation with more detailed explanations. Several ranchers suggested other lands for military maneuvers. The District countered that the project under discussion [Trinity site] might endanger the normal operations of pilots in those flight areas. In addition, Secretary of War Henry L. Stimson took the unorthodox step of personally explaining to Governor Dempsey the intricacy of Army real estate transactions. The Army preferred to lease whatever sections of land that it needed, paying full market value as sub-lessees where necessary. Purchase agreements existed only where permanent facilities required them, or where military exercises damaged the environment beyond repair. In the case of state lands, Stimson offered to trade other federal tracts for the Alamogordo extension as a means of avoiding condemnation proceedings.[31]

In his response to the Secretary War, Governor Dempsey revealed the awkward relationship that his state had with the federal military presence in World War II. New Mexico appreciated the infusion of monies that the war entailed, but the activities of the armed services left unanswered many questions about the postwar era. The state relied heavily upon royalties from the uses of its public lands to finance education, social welfare programs, and the correctional system of New Mexico. Albuquerque District leases in the Carlsbad and Hobbs areas covered potential oil and gas drilling sites, which promised far higher rates of return than that of the federal government's assumption of grazing fees. The only feasible solution for New Mexico was outright sale of the land to the Army and investment of the proceeds to compensate for reduction of the state

land base.[32]

New Mexico and the War Department agreed upon a complicated set of leases, land swaps, and purchases to solve the dilemma of the Alamogordo Bombing Range. For the first few months of 1944 the lands served as practice areas for pilots from the Alamogordo airfield. In the summer several officials of the Manhattan District and the Los Alamos laboratories flew over the area as part of their reconnaissance missions to select the best location for testing an atomic device. Alamogordo was but one of the eight candidates for this honor. Others included the Mojave desert of California; one of the Channel Islands off the coast of Los Angeles; the lava beds of Grants, New Mexico; the Navajo "checkerboard" area near Chaco Canyon; the barrier islands along the Gulf Coast of Texas; the San Luis Valley of southern Colorado; and the Dragoon Mountains near Willcox, Arizona. Each of these sites shared the Army's criteria for good weather, isolation from major population centers, and open space. But only Alamogordo met the need for easy access to the compound at Los Alamos, and the journey took six to eight hours over two-lane roads alternating between pavement, dirt, and sand.[33]

Once the Trinity site received Manhattan District approval, the Albuquerque Engineers assumed responsibility for its construction. At a meeting with Captain Samuel P. Davalos, Post Engineer for the Corps at Los Alamos, Lieutenant Colonel Reuben Cole expressed concern over the source of funds for such an undertaking. Normal channels of authorization could take weeks, and Manhattan wanted crews headed south at once. Cole knew that each Corps district received an "Emergency Relief Fund" of $1 million annually to expend on temporary flood control works. Davalos suggested to Cole that the Trinity site was certainly of "emergency proportions," and from that segment of the District budget came appropriations to dispatch a crew of 100 District employees to begin construction of the base camp.[34]

When the District and its contractor, the J. D. Leftwich Construction Company of El Paso, arrived on the scene they confronted two unforeseen hazards. Colonel Roscoe Wriston, commander of the Alamogordo airfield, did not like surrendering a large portion of his grounds for a project that was not fully explained to him. More serious was the presence of 41-year-old rancher David McDonald, who surprised Davalos and the Albuquerque personnel by inhabiting his home on the proposed site. McDonald had received payment for his grazing leases, but because no one had intruded on his homestead until late 1944 he felt no need to remove.

In meetings between McDonald and the District's representatives, the rancher claimed that he grazed cattle on 24,000 acres of private and public lands. Two parcels of 640 acres each belonged to himself and his family. When the Albuquerque District first approached McDonald, its real estate officers presented him with the same option as they had some 90 other families in the area: the purchase of their homesteads and the sublease of their state and federal grazing lands. After the war the government felt that it could not return the land to its original owners for reasons of national security. McDonald countered that the Army owed him repayment of losses incurred because he could no longer run cattle on the Trinity site. In the fall of 1982 the rancher ventured back onto his old homestead to dramatize what he considered unfair treatment by the Albuquerque District four decades earlier.[35]

By November 1944 the District had engaged over 100 individuals from its many project offices in the construction of Trinity site. The District brought

camping equipment and dismantled several CCC buildings for temporary shelters, and in an odd twist refurbished the old ranch house of David McDonald with room dividers, work benches, and a map area. Within two months the site boasted of "four barracks, a mess hall and kitchen, a commissary, a vehicle repair station," and facilities for storage. No one knew the exact number of employees to be stationed at Trinity, nor the duration of their assignment. Thus the original plan to accommodate 160 residents in January 1945 grew to 300 by mid-summer, and the population of Trinity swelled to 425 on the weekend of the test.[36]

To assist the District in meeting its latest round of deadlines, District Engineer Cole hired Ted Brown and his Albuquerque construction firm. Brown had earned the respect of Cole for his high degree of professionalism and his ability to complete work on time. The District swore Brown to secrecy, had him sign a blank contract, and promised him top priority for all materials and technical expertise. The company responded by employing 200 laborers on day-long shifts for 30 days in succession, marked by a brief respite and a return to the hectic pace. By May they had built dozens of poles, wires, bunkers, and towers that could only indicate the testing of a large explosive device. On 7 May such an event took place, when a wooden tower holding 100 tons of TNT disintegrated, giving off an orange glow for 60 miles all around.[37]

Living conditions for Brown's employees were not the best, nor would these conditions improve significantly for the coterie of scientists and engineers who flocked to Trinity in the summer of 1945. The fine gypsum sand of the desert seeped into the most airtight of facilities, and the 100-degree heat challenged the stamina of all who worked there. The dirt roads throughout the test site raised clouds of dust when traversed by construction vehicles, and water had to be carried from the Rio Grande at the rate of 20 trucks per day to keep the roads passable. Eventually the District created a mix of asphalt and gravel from local sources to pave 25 miles of roads at a cost of $5,000 per mile.[38]

The last major task facing the District and Ted Brown was construction of a tower for the 214-ton container that would house the plutonium of the atomic bomb. An elaborate network of railroad lines was created to bring the vessel, nicknamed "Jumbo" for its size, to an area called Pope's Siding south of Socorro. Then the District instructed Brown to carve a 25-mile road through the desert to support a 64-wheel flatbed trailer that would carry the bomb casing to Trinity site. Finally, a 100-foot steel tower went up in June to hold the prospective weapon, and all parties awaited the arrival of Oppenheimer, Groves, and the others from their laboratory with the device itself.[39]

The detonation of the atomic bomb culminated three years of painstaking and nerve-wracking work on the part of many individuals across the country. Because the Manhattan and Albuquerque Districts labored in secrecy, few Corps personnel understood the relationship of the various tasks at Los Alamos, Zia, and Trinity. Both Districts kept discussions of the Manhattan Project to a minimum, giving rise to all sorts of speculation on the work conducted in New Mexico. But when the bomb exploded at 5:29 am on 16 July 1945, breaking windows in towns 100 miles away and giving off light that could be seen as far north as Denver, Colorado, many people realized that the fortunes of World War II would quickly change. J. Robert Oppenheimer, student of the Sanskrit language and Oriental religions, quoted from the Hindu text, the *Bhagavad Gita,* at the test site: "I am become Death, the destroyer of worlds." The shock wave from the blast knocked two men to the ground two miles south of the test site,

and the 100-foot steel tower built by the Albuquerque District had vanished.[40]

It was but a matter of weeks from the date of the Trinity testing to the application of atomic weaponry in the Pacific theatre against the Japanese. The fears held by many of the consequences of releasing such unchecked power faded as the Japanese government surrendered, and the long and violent conflict came to an end. Estimates of one million U.S. lives spared with the sudden cessation of hostilities helped Americans accept the awesome dimensions of nuclear war. But doubts lingered as to the potential of atomic power in the future, and many individuals have yet to rationalize in their minds its strengths and weaknesses.

In his reminiscences of life at Los Alamos and Trinity, General Leslie Groves spoke only briefly of the work conducted by the Albuquerque District. Textbooks on New Mexico history ignore the contributions of the District to the war effort, and the meaning that those diverse activities held for the future of the state and the nation. Several theories have been suggested for this oversight, including the secrecy of the missions, the subordinate role of Albuquerque to the Manhattan Project, the scale of work and hurried pace of construction, or the ambiguity with which nuclear weaponry has been judged ever since. Yet the employees faced the moral dilemma squarely by following their orders, relying upon their training and expertise, and devoting themselves to full support of the war in whatever fashion it required. For them their mission was clear. It is for others to determine the measure of praise or blame that history will bestow upon their efforts.

V

POSTWAR MILITARY CONSTRUCTION, 1945-1970

In 1945 the United States stood at a threshold in world affairs. Victory in two theatres of war had secured for the nation a place as a global power, while expenditures of federal funds during the war had ended the cycle of economic stagnation. Concerns then emerged about America's role in rebuilding war-torn countries, and about the looming presence of Soviet Russia. The euphoria of V-E Day, however, would be disturbed by the paranoia and insecurity of the Cold War. From this would come a permanent state of military preparedness, the rush to develop advanced nuclear weapons, and the high-technology crusade of the space race.

The Albuquerque District would participate in all three missions, and would utilize its experiences in World War II to serve the nation and the Southwest. Then changing circumstances in the late 1960s would confront the District, as military construction, a source of great pride to District employees, would be lost in a series of defense budget cuts and district realignments. Between these years the Albuquerque District fulfilled every mission asked of it, despite facing the same obstacles of logistics, deadlines, and political intrigue that had become standard fare by 1945. The Albuquerque District's success would make the transfer of military work all the harder to accept, and begin a cycle of internal questioning that lasted for nearly a decade.

When the level of military work first subsided in 1945, the Albuquerque District encountered a difficult situation. It had acquired expertise in design and construction of military facilities of all descriptions. From army bases to atomic testing sites, the Albuquerque District had demonstrated its responsiveness to national and international crises. For this the District had received high praise from military and political officials in World War II. The District also surrounded itself with highly trained civilian employees and private construction firms who had proved their worth from the Dodge City Airfield to the Los Alamos laboratories. Yet the natural retrenchment of defense spending in 1946 reduced the Albuquerque work force significantly and threatened to eliminate the District altogether.

Two factors surfaced in the early postwar years to sustain a viable work schedule for Albuquerque and to guarantee the continuation of District activities in the Southwest. New Mexico Congressional leaders wanted to utilize the District in constructing water projects to foster regional economic stability. For this task the District needed a full measure of staff and support personnel. In addition, the national promise to confront the threat of Communist expansion brought a series of authorizations to the District that ranged from base construction in the late 1940s to the space program of the 1960s.

In the summer of 1946 the Albuquerque District completed an inventory of surplus military facilities within its boundaries. Everything from scrap iron to grazing leases went to storage, auction, or to the original owners. For these pur-

poses the District established temporary offices at Kirtland Air Force Base and Fort Bliss Army Base, and recalled its employees to Albuquerque upon completion of these tasks for the War Assets Administration. All that remained for the next year were several minor studies of water projects on the Rio Grande, necessitating the first of several reductions in force for the District.[1]

In the midst of this downturn, the Albuquerque District became involved in the escalating tensions between the United States and the Soviet Union. The War Department had never ceased its support of nuclear weapons research, despite the misgivings of several prominent scientists connected with the Manhattan Project. In September 1947, Kirtland AFB received promotion to the status of an Air Force Research Center. This required lengthening its runways to carry jet fighter planes loaded with atomic weapons. In 1948, the District received a $10 million authorization to erect Manzano Base, a nuclear weapons storage facility directly east of Kirtland. Bunkers were hollowed out of the foothills of the mountain range bearing the same name, connected by a system of roads to permit easy access from Kirtland. The work at Manzano Base calmed the fears many employees had for their futures, and contributed in the 1950s to the formation of a New Mexico nuclear research complex consisting of Sandia Laboratories, Kirtland and Manzano Bases, Los Alamos, and White Sands Missile Range.[2]

While the Albuquerque District labored to complete its nuclear weapons storage works, in September 1950 President Truman dispatched American soldiers to the growing conflict between North and South Korea. The United States government wished to counter the influence of Russia and later China on the Korean peninsula. This required many of the western United States military bases to prepare for action in the Pacific. The Albuquerque District suddenly had several missions to fulfill, and the work load continued for the next ten years. The District initiated the re-purchase and leasing of grazing lands for bombing ranges near White Sands and Fort Bliss, reviving the controversy of the previous decade with ranchers and stockmen. The pressure of deadlines created major problems, and U.S. Representative Clair Engle [R-CA] introduced a bill to prohibit withdrawal of more than 5,000 acres of the public domain by the Army Engineers in condemnation hearings without the consent of Congress.[3]

These latest issues facing the District went beyond the acquisition of land and the design of new facilities. So much work came to New Mexico and the Southwest in general that problems of contracting, oversight, and management of locations spawned crises of their own. Among these were eager politicians and construction companies, hard-pressed work crews, the loyalty of District personnel, and the constant demand to deliver services under strict deadlines. The District would experience temporary manpower shortages, which were then followed by reductions in force. Then new contracts brought a return to capacity staffing. The District held up as best it could in the uncertain atmosphere of the Cold War, and managed to retain its well-earned reputation for quality and efficiency first achieved in the 1940s.

The Albuquerque District confronted early the matter of definition of its territory and distribution of the work load. In January 1951, U.S. Representative George Mahon [D-TX], wrote to Colonel Charles McNutt, District Engineer, seeking clarification of Albuquerque's boundaries. As a strong supporter of his state's economy, and chairman of the House Subcommittee on Military Appropriations, the powerful Congressman wondered why Albuquerque had authority

over military installations in west Texas. McNutt informed the Congressman that the District managed all facilities west of Lubbock, because these had been constructed by the District in World War II. Mahon's interest would portend the future, however, as Texas politicians always questioned Albuquerque's presence in their state as a competitor to the newly formed Fort Worth District.[4]

No sooner had the Albuquerque District confirmed its regional status than contracting problems arose. The Army wielded great economic influence in a state like New Mexico that had little manufacturing capacity, and which relied heavily on federal expenditures for its survival. In an article in the 13 May 1950 issue of *Business Week,* Albuquerque earned the nicknames of "Uncle Sam's Town" and "Little Washington" for its many military and governmental agencies. These would attract construction and architecture firms seeking a share of the federal largesse, and inevitably draw the attention of New Mexico's political leaders. Controversies would be no stranger to the District's selection of contractors, marking the decade as one of great external pressure and unavoidable burdens.[5]

The volume of projects led the Albuquerque District to rely upon several contractors with whom it had established good relations in World War II. These included W. C. Krueger and Associates, holder of 40 contracts in the 1950s, and Gordon C. Herkenhoff, who had served as state director of construction for the Works Progress Administration in the 1930s. This arrangement disturbed companies with national and regional reputations who desired access to the lucrative Albuquerque contracts. W. F. Turney and Associates of Santa Fe learned that someone had erroneously informed the District that their company disliked certain aspects of airfield construction. G. G. Kenson, administrative assistant to the Del E. Webb Construction Company, best known for its resort and retirement communities in the West, told the District that it had organized a consortium of firms to bid on any chemical or biological warfare facilities. Kenson described the personnel as having "imagination and intelligence, adaptable to any type of design or construction."[6]

Other prospective applicants took more bold and direct approaches to catch the eye of Albuquerque District procurement officers. Airways Engineering Corporation of Washington, DC, wrote to Colonel Lynn Barnes of the District prior to a request for proposal from the District in 1953. R. C. Phillips, Jr., president of Airways, reminded Barnes that the U.S. Air Force Research and Development Branch had anticipated funding an elaborate network of missile facilities. "We should appreciate being advised whenever an approved program would warrant a conference with you," said Phillips, to "gain your consideration for an actual project added to your program." Not to be outdone, in 1958 the engineering division of Henry J. Kaiser Company, builder of military and civil works projects on the West Coast and in Hawaii, purchased advertising time on the top-rated television show, *Maverick,* to promote its construction capabilities. J. W. Desmond of Kaiser's "Government Projects Department" asked District Engineer Colonel Albert L. Reed to watch the program and submit any comments that he had about the effectiveness of the advertising campaign.[7]

The voluminous quantity of District work inspired certain contractors to approach New Mexico's political leaders to wield influence on their behalf. Throughout the decade of the 1950s the state was represented in the U.S. Senate by Dennis Chavez and Clinton P. Anderson. Both sought increased federal expenditures to strengthen the local economy. Chavez worked closely with military officials on base construction, while Anderson maintained a seat on the

Senate committee dealing with atomic energy and aerospace work. Between them the state and the District attracted a substantial number of military authorizations during the Cold War.

The arrangements worked out by Chavez and Anderson to handle contractors' requests took several forms. Applicants to the District sometimes included a letter of endorsement from either senator. In a few cases the District asked the New Mexico leaders for their recommendations, with one example being the multi-million dollar authorization to build a test track and other facilities at Holloman Air Force Base near Alamogordo. Dennis Chavez informed Colonel Barnes that he had "always favored local firms receiving federal work over out-of-state firms." Chavez supported the bid of Southwest Engineers, Inc., a subsidiary of Airways Engineering Corporation. The senator also reminded Barnes that the city of Albuquerque constituted a "Group IV" area, a statistical indicator of the Department of Labor designed to allocate contracts to areas where unemployment exceeded six percent. Chavez hoped that Southwest could gain the contract and contribute to revitalizing the state's economy.[8]

Senator Anderson also intervened on behalf of his constituents in procurement matters with the Albuquerque District. Anderson's relationship with the Corps dated to the early days of Conchas Dam. He had served as director of both the state and federal relief programs, which became major sources of manpower for the Conchas project. Anderson's Albuquerque insurance company also acquired the premiums on the buildings at Conchas, an outgrowth of his coverage of many state facilities in the Santa Fe area during the tenure of Governor Clyde Tingley. Anderson echoed Chavez's support for Southwest Engineers at Holloman AFB, informing Colonel Barnes that "it is extremely wise to have made use of the services of a firm located within this state." When the contract bids were opened, said Anderson, he hoped that it would go to Southwest. Unfortunately for Southwest Engineers, another local firm owned by Gordon Herkenhoff received the award.[9]

The contracting challenges of the District did not end with the involvement of the New Mexico senatorial delegation. At the close of the Korean war in September 1953, the volume of military construction declined. Contractors who lost out in these harder times cited several reasons for their failure. Coleman L. Hasie, of the Lubbock engineering firm of Hasie and Green, asked Colonel Barnes to explain why the District had awarded four out of five contracts at Clovis AFB that year to one firm. "By not having a proper share of the work," said Hasie, "and not having it fairly evenly divided, in times like this, it could be the difference of whether you stay in business or not." Hasie and Green had "always been advised that it would be difficult for a Texas engineer to get work in New Mexico," and they were "certainly sick about the deal under the circumstances."[10]

For those contractors who received work from the District, a host of problems related to hiring, pay scales, and charges of discrimination became routine fare. Tibo Chavez, member of the prominent Chavez family and Lieutenant Governor of New Mexico, wrote to the Munitions Board of the Defense Department in 1952 to complain about the presence of non-natives in the work forces of District contractors. Chavez cited the example of the Santa Fe Railway, which would not require the Brotherhood Unions of engineers, conductors, firemen, and brakemen to employ Hispanic people on their crews at New Mexico military installations. The lieutenant governor informed the President's Committee on Government Contract Compliance that the Southern prejudice against blacks in

labor unions had extended to minority groups in the Southwest, resulting in what Chavez called "highly unamerican practices."[11]

Beyond charges of discrimination, the District also confronted the controversial Davis-Bacon wage scales for federal construction projects. Enacted in 1931 in the midst of the Depression, this law required the Secretary of Labor to establish "prevailing wage rates" for contracts involving public works over $2,000. Employees would be paid these rates to enhance worker purchasing power and to boost local economies. In the 1950s contractors from Texas could underbid New Mexico firms because Texas was a non-union state with lower wage scales and benefits packages. In 1954 this inherent advantage prompted leaders of New Mexico's trade unions to charge the Albuquerque District with favoritism. Joe Bermudez, secretary of the Hod Carriers and Common Laborers Local 16, believed that out-of-state contractors misclassified their workers to avoid Davis-Bacon strictures. James A. Price, of the New Mexico Building and Construction Trades Council, claimed that local contractors lost business to firms paying lower wages and overtime rates. All critics disliked the practice of the Albuquerque District investigating itself, claiming a conflict of interest between contracting officers and the owners of the firms in question.[12]

Problems of contract labor for the District had their equivalent with matters of internal staffing. Military construction schedules developed more rapidly than civil works projects, due to the uncertainty of defense needs and the yearly funding cycle of Congress. The District rarely knew about its proper level of employment or the various skills needed to fulfill its missions. This gave rise to the paradox of reductions in force even as the District actively recruited graduate engineers from local colleges. Often the District had no other explanation for its severance of employees than overstaffing in certain areas. The Corps personnel could not plan their individual futures, and the District would face identical crises of construction when factors of funding changed once again.[13]

The peripatetic nature of employment was not the only concern of the District in its search for engineering talent. The Corps fought a nationwide skirmish with other federal agencies and private industry for the best graduates of the nation's technical schools. The decade of the 1950s experienced an accelerated pace of consumerism. This meant the employment of large numbers of engineers for the many corporations and businesses producing consumer goods. The federal government also embarked upon such extensive public works programs as the Interstate Highway system, energy and resource development, and a host of water projects. The Army Engineers faced hardships in attracting young students to its ranks, and met with only mixed success throughout the decade.

The Albuquerque District first noticed this oncoming personnel crisis in March 1952. A national radio broadcast estimated that the number of engineering graduates would decline precipitously in the 1950s as World War II veterans left college. By 1954 the total of such students would fall to 17,000, less than one-third the number graduating in 1949. OCE also recognized this predicament, and called upon its districts to recruit locally to supply domestic and foreign Corps programs. Lieutenant General Lewis A. Pick, Chief of Engineers, informed Colonel Herbert D. Vogel of the Southwestern Division that he would hold Vogel "personally responsible for the quality of personnel selected." Other approaches included sending speakers to college audiences, making slide show and film presentations, and establishing engineering courses in ROTC programs.[14]

As the recruiting process intensified, the District went beyond traditional outreach to target certain individuals for special notice. OCE suggested that each engineer district contact several new first classmen on summer leave from the Military Academy at West Point. These invitations would be "informal and friendly in tone," should "encourage the bringing of family guests," and include a boat trip of some sort to dramatize the Corps' role in managing the nation's water resources. Since the cadets had limited travel funds, the letters would cite anticipated costs for personal expenses, and the items covered by the local district engineer. OCE would assist in this process by providing each district with a list of cadets who would be on leave in a given area, as well as a fund to help defray the expenses of recruitment.[15]

The Albuquerque District received these instructions in the spring of 1952. Immediately the District approached several cadets to arrange personal visits. Colonel Hebert N. Turner, Acting District Engineer, wrote to Cadet Gary Hutchinson, a native of El Paso, to encourage both himself and a friend, Cadet Earl Chambers, to observe the workings of the District. Turner explained the major functions of the Corps to Hutchinson, and noted that the District's workload in the early 1950s consisted primarily of military construction. Turner mentioned the $12 million worth of contracts outstanding at Fort Bliss, and then suggested a two-day visit to Conchas Dam, where the Colonel planned a program of recreation that included a sightseeing trip and fishing. The Acting Engineer encouraged the cadets to bring their families, who would be lodged at Conchas for one dollar per day. Turner also welcomed any female friends of the cadets, whom he referred to in the military vernacular of the day as "your drags."[16]

Despite the exhaustive nature of the recruitment process, after one year Colonel Barnes reported that the basic problem of employing top engineers remained unchanged. Barnes acknowledged that "stability of [the] work program" and "motivation of trainees" hindered retention rates, and that the "inability to obtain probational status above grade of GS-7" ranked first. Young engineers could be "bumped out" of the higher wage brackets under a newly established federal order entitled "Displaced Career Employees Program." Barnes asked his superiors in Washington to enact a system that hired good young graduates regardless of the current workload, increased their salary schedules to compete with other agencies, and guaranteed them a probationary status of GS-9. The District Engineer encouraged OCE to implement this plan nationwide, making it one of the weapons in the fight to attract the best engineering minds to the Corps.[17]

By the mid-1950s, the District had in progress dozens of military construction projects ranging from land purchases to rocket launches. Albuquerque worked in close alliance with the Army, Navy, Air Force, and the Atomic Energy Commission to prepare facilities deemed essential for the Korean conflict and the years after. Because much of Albuquerque's work fell under the category of "top-secret," OCE took great pains to insulate the District from the potential for sabotage and subversion. This action came in response to charges leveled against the Army by Republican Senator Joseph McCarthy of Wisconsin, who suspected Communist sympathizers of infiltrating the ranks of many federal agencies. Even J. Robert Oppenheimer, civilian director of atomic weapons research at Los Alamos, lost his security clearance in 1954 when the Atomic Energy Commission [AEC] feared his criticism of the hydrogen bomb and the nuclear arms race. As evidence against him, the AEC cited his friendship with

Communist Party members in the 1930s and his second wife's membership in the party.

The McCarthy "witch hunts" uncovered very few agents of the Soviet Union in any segment of public service. But the temper of the times prompted the Albuquerque District Engineer in 1955 to distribute a seven-page memorandum entitled, "Organizations Designated as Totalitarian, Fascist, Communist or Subversive." Presidential Executive Order 10450 targeted dozens of groups "having interests in conflict with those of the United States." The memorandum warned all employees that "affiliation or association, past or present, with any one or more of the organizations listed entails serious risks on your part in connection with security determinations." The roster included such obvious groups as the U.S. Communist Party, the Ku Klux Klan, and the Socialist Workers Party. Yet more revealing of the turmoil and fear of the 1950s was the inclusion of organizations as innocuous as the "Queensbridge Tenants League," the "Finnish-American Mutual Aid Society," or the "Committee for the Negro in the Arts."[18]

The paranoia of the Cold War led the District to develop conflicting policies to guard against any negative images generated by the McCarthy hearings. On more than one occasion the District Engineer released memoranda on "standards of conduct" for Corps employees and contractors. In 1952 Colonel Turner warned potential bidders about the "Gratuities Clause" in government contracts. This prohibited offering blandishments to Corps personnel and prescribed penalties for contractors making such attempts. H. R. Howard, Project Engineer at Sandia Base, reminded employees to abide by the restrictions of the Hatch Act regarding participation in political campaigns. These included membership in political clubs, wearing campaign buttons at work, and driving voters other than one's family to the polls.[19]

While the District watched the behavior of its contractors and personnel, OCE sought to utilize its relationship with private enterprise to gain favorable publicity. Although Corps employees could not campaign actively for political candidates, Colonel A. C. Welling of OCE called upon all district engineers to compile a "select list of influential citizens in the professional, industrial, and business world who are desirous of assisting in aggressively publicizing [the Army's] mission, accomplishments and role in the defense of our country." Welling asked the districts to include a "brief biographical sketch and other pertinent data," and to highlight individuals who were "enthusiastic towards the Army, recognized experts in their particular fields of endeavor, and have gained the respect of their fellowman by outstanding public service."[20]

In response to OCE's request, Colonel Barnes informed Colonel Lyle E. Seeman, Southwestern Division Engineer, that he had contacted several individuals on the subject. Barnes felt confident that his District understood the ramifications of the proposed public relations gesture, "since military installations, military construction and weapons research play such a significant role in the economy of New Mexico and west Texas." Defense contractors in the District also recognized "a great potential in becoming a leading center in non-military research in the atomic energy field." Support of the "present military construction and research programs," said Barnes, was an "essential step if this area will be a leader in technical research." Included in Barnes' category of staunch supporters were Robert W. McKee, Sr., president of the Zia Corporation of Los Alamos, John F. Simms, Jr., then-governor of New Mexico, and Oscar Love, vice-president of Albuquerque National Bank and a seven-year director of the Albuquerque Chamber of Commerce.[21]

Even though the District worked to maintain cordial relations with business concerns, it also drew attention from Congressmen charged with oversight of military spending. The Albuquerque District attracted unfavorable comment from the same Congressional committees that had ordered the District to undertake the construction work. In September 1956 a U.S. House of Representatives Appropriations subcommittee suspected that the District had an inordinately high rate of cost overruns on its missile programs. Robert E. Rightmeyer, a special agent of the Federal Bureau of Investigation, received an assignment from the subcommittee to visit the District and inspect construction work at Fort Bliss, Biggs and Kirtland airbases, and White Sands Missile Range. The Rightmeyer commission specifically requested records of all contracts exceeding 20 percent of their original bids. Although the investigators uncovered no major problems with District management, they did point out that Albuquerque's work load inevitably led to minor errors of design, construction, and deadlines. In an unsigned memorandum on 30 October 1956, the District Engineer, Colonel Robert E. Cron, Jr., accepted their judgements, and cited the need for the Pentagon to dispense its funds at a more measured rate to avoid future cost overruns.[22]

A second political controversy involving the District was its work at White Sands Missile Range. Each branch of the armed forces approached Congress for monies to build guided missile systems, and the White Sands test site acquired a large portion of these construction funds. In 1959 Representative Albert Sikes [D-Fla.] questioned officials from OCE about conditions at White Sands, and why the various services competed with each other for use of the facility. Sikes had a reputation as an advocate of military spending in his northwest Florida district, and wanted more missile work located at Eglin Proving Ground near his hometown of Pensacola. "If there are facilities," asked Sikes in committee hearings, "that are not being used to fullest possible advantage [referring to Eglin], are we justified in creating another high-priced facility at White Sands?"[23]

Corps officials responded to Sikes by detailing the many missile programs stationed at the southern New Mexico site. These included the Ajax, Hercules, and Zeus projects in the Nike series, as well as the Corporal, Sergeant, Hawk, Honest John, Little John, and Redstone programs. The Corps noted that New Mexico offered one of the few test sites where missiles could be launched and tracked overland. In addition, the state contained the nuclear weapons laboratories of Sandia and Los Alamos, the uranium mines and mills near Grants, and storage facilities at Manzano Base and Fort Wingate Ordnance Depot. Contracting firms like W. C. Krueger and Kenneth Clark in Santa Fe provided expert design and research on many projects. At the end of the Corps' testimony, however, Representative Sikes remained unmoved. "There's some feeling," he said, "that there is no real effort on the part of the services to save money by using existing facilities, but that you simply proceed to build a new facility if you can get Congress to spend the money, and that you deliberately try to keep out of old facilities because something new is naturally preferable."[24]

The Albuquerque District construction debate did not relent with the close of the 1959 appropriations hearings. Representative Sikes was joined in his criticism of this work by his colleague, Henry Shepard [D-Calif.], chairman of the House Appropriation subcommittee on military construction. Shepard made an offhand comment criticizing the District in an interview with the *El Paso Herald Post*. While touring new Bachelor Officers Quarters [BOQ] at Fort Bliss,

Shepard detected "shoddy" workmanship and "poor construction." The chairman referred specifically to "a split going down the side of the BOQ building 16 feet long, 3½ inches wide at the top and 1¼ inches wide at the bottom." The chairman's remarks caught both the District and the Army officers at Fort Bliss by surprise, and they searched in vain for the building mentioned by Shepard. After careful scrutiny the District discovered that not only did no such deficiency exist, but that no one had any recollection of Shepard's visit to the base. As for the "crack" in the BOQ unit, the Congressman had seen a stress device made of sheet metal imbedded in the concrete to help the units withstand the annual extremes of temperature experienced in the high desert city of El Paso.[25]

In 1960 the Albuquerque District finally located its offices in one central facility, at 517 Gold Avenue, Southwest. Throughout the 1950s the District had personnel located in several office complexes in the city, including Kirtland AFB, the present-day location of Lobo Campus Pharmacy on Central Avenue Southeast, and rooms at 121 Yale Avenue Southeast. In that same year the District participated in the formation of the Corps of Engineers Ballistic Missile Construction Office [CEBMCO]. This marked the contribution of the District to the new space programs instigated by the Soviet Union's launch of the Sputnik satellite in 1957. For the next dozen years the competition between Russia and the United States would expand far beyond the parameters of the preceding decade, with the Albuquerque District participating actively in the race to nuclear supremacy.[26]

The increased District work load meant the transfer of the Atlas Missile programs from White Sands to Walker AFB. The Corps purchased 12 test sites in the Roswell area between 1960 and 1962, and built a network of telephone and utility cables connecting each. Then missile silos were sunk into the test sites for the Atlas rockets. Unfortunately the Walker construction project suffered three major accidents that caused a total of eight worker fatalities, six of them in one incident. Then as the District concluded operations at the Roswell sites, word came from the Pentagon to phase out the Atlas program as part of the impending Nuclear Test Ban Treaty of 1963. Two of the silos caught fire and were destroyed, while the remaining locations were disassembled.[27]

As the District worked on the ill-fated Atlas project, international tensions again stirred the passions of the Cold War. The administration of President John F. Kennedy came to the White House in 1961 determined to outdistance the Russians to the moon, and to close the alleged "missile gap" between the United States and the Soviets. Kennedy also decried the state of American military preparedness, and the Eisenhower-Nixon administration's wish to scale back defense spending to avoid what the former Supreme Allied Commander had called the "military-industrial complex." On Inauguration Day the rhetoric reached new heights when the 43-year-old Chief Executive promised that the United States would "pay any price and bear any burden" to resist the forces of Communism around the world.

Although the wisdom of Kennedy's Cold War revival has been debated at length, it did stimulate federal spending on military construction. The Kennedy administration raced feverishly to "rebuild" America's defensive capabilities, with little question of the cost. As with the military escalation of the early 1950s, many doubts surfaced as to the necessity of these expenditures. Representative J. Edgar Chenoweth of Colorado, known for his conservative economic views, confronted an official of the Los Alamos Scientific Laboratories who appeared before the House Appropriations subcommittee in late 1960. When asked

by Chenoweth if the labs had sufficient funds for construction work, he replied, "We are satisfied with our current status." Yet in late January 1961, one week after the Kennedy inaugural, the same Los Alamos official returned seeking emergency funding of $6 million in construction projects. "Why have matters changed at the labs," asked Chenoweth, to which the administrator replied, "We now have a new President."[28]

Regardless of motives, the Albuquerque District received additional authorities over a broad range of territories encompassing many diverse tasks. Albuquerque's boundary stretched eastward into Texas and Oklahoma, where it supervised construction at the following military bases: Dyess [Abilene], Sheppard [Wichita Falls], Goodfellow [San Angelo], Webb [Big Spring], Amarillo, Altus, and Fort Sill. This additional responsibility brought increased work for the Real Estate Division of the District. Albuquerque disposed of hundreds of acres of land and dozens of World War II-vintage facilities at Altus, Sheppard, and Fort Sill. Kirtland AFB also deeded back to the city of Albuquerque several thousand acres purchased during the war, which the city wanted for expansion of its new airport to meet the needs of its burgeoning population.[29]

The major concern expressed by the Kennedy administration in its early months was the need for increased missile productivity. But another program soon appeared to draw attention from military construction, and to give the Albuquerque District perhaps its most glamorous project. The President feared publicly that the Soviets would one day outstrip the United States in space, gaining the ultimate "high ground" of the moon and the earth's stratosphere. Not wishing to lose this scientific and technological battle, Kennedy summoned the nation to participate in the "space race," an intensified program to place Americans on the moon by the end of the decade. The embarrassment of Sputnik would vanish as the United States claimed the upper hand in the clash of superpowers, and achieved new discoveries in space.

Announcement of the space program meant that New Mexico would seek its share of the authorizations. The Albuquerque District had served well in the missile projects of the 1950s, and by decade's end had the advocacy of Senator Clinton Anderson and his Aeronautical and Space Sciences Committee. At first the District worked only on the testing of the "Little Joe" rocket that would carry the astronauts of the Mercury and Gemini phases of the space program. The facilities at White Sands offered the same amenities as during the atomic bomb and subsequent missile firings, but the rapidly expanding space center at Cape Canaveral, Florida, garnered most of Congress' financial and political support.

As the National Aeronautical and Space Administration [NASA] developed its plans, it became aware of two limitations. The scale of future projects, primarily the moon landings of the Apollo programs, required more space for facilities and testing than southern Florida could offer. Many political leaders also sought decentralization of the space program to distribute the workload more equitably. The nation had never before attempted such a complex scientific project, and many corporations would benefit from experience gained through working on the space program. President Lyndon B. Johnson encouraged the growth of the Houston Manned Space Center in his home state of Texas, and Clinton Anderson pressed for the same cause at White Sands.

In early 1963 the Albuquerque District receive word that NASA had become disillusioned with the quality and pace of work of the Apollo program's primary contractor, North American Aviation. The District had undergone yet

another retrenchment in its workload, from a military construction budget of $80 million in 1959 to less than $20 million in 1962. To preserve its manpower capacity, the District approached NASA with an offer to undertake research, design, and construction management of the Apollo facilities at White Sands. The District informed NASA that it had pioneered in military construction at the missile range, and since 1945 had successfully completed $140 million worth of contracts there. The District understood the unique climatic and geologic conditions of southern New Mexico, had formed a pool of highly skilled civilian engineers to work with the local contractors, and could be counted on to meet hectic schedules with little waste or mismanagement.[30]

The situation at White Sands deteriorated rapidly in the eyes of NASA officials as deadlines passed with no appreciable signs of completion by the private contractor. The range had won out over 15 competing test sites for the propulsion and shutdown systems, and contractors impatiently waited to conduct their portion of the Apollo mission. Finally the planners at NASA agreed to release North American Aviation from its contracts and give control of the Apollo work to the District. NASA charged that North American had hindered the progress of its major subcontractor, the Ralph M. Parsons Company, by its delays. This left the overall testing schedule in jeopardy. Further complicating matters was the excessive cost of North American's facilities. NASA knew that the Apollo program would be expensive, and had budgeted $6 billion for construction at White Sands. North American Aviation, however, estimated that their final costs would exceed $8 billion. At this point NASA turned to the Albuquerque District to reduce runaway costs and help the contracting firms meet their deadlines.[31]

Securing the Apollo work affected the Albuquerque District as had few other projects in its history. Rumors flew of the size and scope of Apollo, and what it would meant for New Mexico. A Washington-based journal known as *Insider's Newsletter* carried a story in late March 1963 stating that NASA officials planned to move the manned space flight center from Cape Canaveral to White Sands. The paper had discovered the exchange of construction management teams, and also that NASA was studying the possibility of launching and landing a Gemini space craft at White Sands in 1964. The *Newsletter* traced this chain of events to the influence of Senator Clinton Anderson and Representative Thomas Morris of New Mexico, each of whom wielded power in the Congress. When approached by a reporter for the *Las Cruces Sun* for confirmation, Anderson dismissed the allegations. "The decision as to where space projects are located," the senior senator said, "will depend on scientific decisions and what is best for the space program and the U.S. Treasury . . . not on my being on the Senate Space Committee or Tom Morris . . . on the House Space Committee."[32]

While news reporters nationwide pondered the significance of the activity at White Sands Missile Range, the District moved to assume control of all construction at the site. The Corps formed the Southwestern Area Office to coordinate the many phases of work, and fashioned committees of personnel from the District, the Ralph M. Parsons Company, NASA, and the missile site to accelerate the design. The District determined that North American Aviation had built an electrical generating station with nearly double the necessary capacity, and that more water wells would have to be drilled to increase the supply. Bids were let for the access road, power line, and test stand, and by July 1963 all facilities had been designed, solicited, and contracted for completion.[33]

As the District came to understand the complexity of its work at White

Sands, it also recognized problems it had encountered in the early days of the Alamogordo Bombing Range. The Apollo program needed an area of 1.8 million acres, primarily because of the toxicity of the fuel in the "Little Joe" rockets. NASA wanted to launch vehicles a distance of 100 miles, and needed a 40-mile "cushion" of extra space to minimize accidents. Because the Army was also testing the Pershing I missile at Fort Wingate in western New Mexico, the District encountered the need to acquire real estate in both regions.

The District also had recurring difficulties with local residents asked to sacrifice their acreage for national defense. Lieutenant Colonel William P. Gardiner, OCE liaison officer at White Sands, noted that the extent of the Apollo testing required changes in the reimbursement and evacuation processes for area inhabitants. The sheer size of the Tularosa Basin and the uncertainty of the testing schedule hampered efforts to reimburse and relocate citizens affected by each experimental test. Gardiner suggested that the District hire local individuals to notify others of testing in their sectors. These "block wardens," as Gardiner called them, would serve the same function as precinct captains in urban areas at voting time. Their payment came from funds targeted for utilizing District personnel, sparing the Corps many man-hours in the process of notification and removal.[34]

Having solved problems of land transaction, the District turned to the most exotic component of the Apollo construction work: the testing facilities for the Lunar Excursion Module, or LEM. Dubbed the "moon-rover" by pundits in the press, the LEM was designed to transport two Apollo astronauts across the surface of the moon as they conducted their scientific experiments. Although the LEM did not see action until the Apollo space missions of the early 1970s, NASA asked the Albuquerque District to implement a contract for propulsion testing by the summer of 1963. White Sands Missile Range offered the ideal setting for the LEM because most of the Apollo research and design work occurred there. The barren landscape of the range also approximated that of the moon's surface. A marvel of modern technology, the "lunar land rover" met all qualifications in its years at White Sands, and went on to a place in history when NASA personnel operated it successfully on several Apollo flights.[35]

Because of the importance of the Apollo program to his space exploration agenda, President John F. Kennedy decided to visit the facilities at White Sands in September 1963. At that point his popularity in the national public opinion polls had reached 65 percent, and his commitment to funding the space race endeared him to employees of White Sands. The site underwent a hectic pace of activity to prepare for the President's visit, to the extent that several military officials wanted to remove all storage facilities from the planned route for aesthetic purposes. The prohibitive cost of such work meant that Kennedy witnessed the full scale of construction by the District at White Sands, and his remarks to the assembled audience reflected his appreciation for their dedication and sacrifice to his goal. Kennedy's death less than two months later saddened all at White Sands, doubly so because they had just heard him promise further support for their efforts, and offer his thanks for their help in the success of the Apollo program.[36]

With the completion of testing in the Apollo mission by the mid-1960s, the District's emphasis returned to military construction as the undeclared war in Vietnam drained manpower and money once assigned to the space program. Because Vietnam required a large number of infantry, the bulk of the District's work in the war effort consisted of expanding training facilities at Sandia and

Kirtland bases in Albuquerque, and Cannon AFB in Clovis. The high-technology skills of the District did not go unused, however, as in 1966 the Air Force asked the Albuquerque District to construct an Upper Air Research Station in the Sacramento Mountains east of Alamogordo. "Sac Peak," as the structure at 9,200 feet was called, housed the world's largest telescope designed to study and predict meteor showers in space. This information would be of great value to the survival of astronauts. Once completed, the Sac Peak observatory received the Award of Merit from the Chief of Engineers, one of only three such commendations offered by OCE in 1971.[37]

The Chief's architecture award represented a great irony in the fortunes of military construction for the Albuquerque District. As the District completed the observatory, efforts were underway to remove all personnel involved with military work from the Albuquerque offices and transfer them to the Fort Worth District. Many factors of politics, economics and management practices affected this change of mission, and subsequent developments left many Albuquerque employees embittered and disillusioned. Proud of their many accomplishments from World War II to the space age, the District workers could not fully comprehend the meaning of the transfer, and could only grasp at straws for answers.

The "district consolidation and reorganization," as OCE referred to the plan, occurred for several reasons. The neighboring state of Texas had set out on a course to attract defense spending and military installations as crucial elements in its postwar economy. With Sam Rayburn as Speaker of the House of Representatives and Lyndon B. Johnson as successively Senate Majority Leader, Vice President and President of the United States, Texas boasted of the most powerful political leaders in the years of dramatic increases in national military spending. During World War II Texas had ranked below New Mexico in per capita military funding, despite its overwhelming size and population advantages. After the war the Texas delegation to Congress imitated its southern colleagues by bringing military facilities and employment to the state. By 1969 Texas stood just behind southern California in total dollars spent on military procurement, employment and construction.

As with any such infusion of government money, defense spending created a cycle of dependency in those areas where national political leaders delivered contracts on an ever-increasing basis. So long as Clinton Anderson and Dennis Chavez remained in the U.S. Senate, New Mexico also reaped the benefits of the Cold War and Vietnam years. But by the late 1960s both states had to accept the new reality of budget cuts and reduced federal involvement in the local economies. Oddly enough, this emanated from a conservative Republican administration under Richard M. Nixon. Determined to restrict the exponential growth of federal domestic programs under LBJ's "Great Society," Nixon also had to terminate Johnson's escalation of the war in Vietnam. Both social and military spending programs had their staunch adherents in Congress, the federal bureaucracy, and the public at large, because of the prestige and economic value of these programs. President Nixon decided that the only way to achieve his campaign promises of a balanced budget and withdrawal from Vietnam would be to trim both sectors of the government at once.

President Nixon believed that this approach constituted a "Solomon-like" resolution to a thorny issue. But residents of Fort Worth and Albuquerque did not recognize the greater good sought by the President. Both Texas and New Mexico had become dependent on the yearly authorizations. Beneficiaries of fed-

eral social welfare programs had little political clout, but defense contractors and employees of military agencies rushed to the levers of power to temper the consequences of Nixon's actions. In the Southwest demographics dictated the outcome. Texas, with its more central location, its large Congressional delegation, and its stronger internal economy, would be better able to withstand the ravages of budget-cutting than would New Mexico.

The reaction of the employees of the Albuquerque District to the military construction transfer was immediate, prolonged, and anguished. Realizing that their very existence depended upon the intercession of their elected representatives, the employees beseeched any and all officials to reverse the decision of OCE and the Pentagon. Their major champion, Clinton Anderson, was advanced in years and could not muster the energies he had displayed in the 1950s and 1960s when nuclear and space projects came New Mexico's way with regularity. Dennis Chavez had died in 1962, and his successor, Joseph M. Montoya, promised that "the dust [would] not settle" until the District regained its military construction mission. But Montoya could not overcome the influence of the Texas contingent in Washington. The District's staff then took the highly unorthodox step of appealing publicly for help.[38]

On 6 March 1970, Lieutenant General Frederick J. Clarke, Chief of Engineers, sent word to the Albuquerque District Engineer, Colonel Richard West, that all military construction work would move to the Fort Worth District by 29 March. The shrinking military construction budget convinced OCE that Albuquerque's operations and management costs were too high, and that substantial saving could be effected at a more central location. Yet the District's employees harbored resentment at Fort Worth for its superior political influence. James Loughridge, chief of the Construction Operations branch in the 1960s, would receive telephone calls from Fort Worth inspectors who had no travel money of their own, but who wanted to visit New Mexico sites at the District's expense. Loughridge also recognized the failure of Fort Worth to reduce its employees to their standard grades of pay when a particular contract had been completed. Most of all, the District employees believed that prominent Fort Worth and Dallas political and civic leaders, like Amon G. Carter, worked to keep the Fort Worth District solvent.[39]

Upon receipt of orders to terminate all military construction authorities, District workers contacted President Nixon for his help. In a telegram bearing the signatures of 290 members of the District staff, they informed their Commander in Chief that the cuts slated for the Albuquerque District were the most severe for the Corps nationwide. These reductions would have profound effects on themselves and the city of Albuquerque. The most critical question had been the District's expenses, to which the employees produced charts detailing their costs in comparison to Fort Worth. OCE believed that consolidation would save $325,000 yearly, mostly in travel costs. The District argued that Fort Worth would spend more money coming over to New Mexico as a result, and that the New Mexico state legislature would appropriate the above amount if it meant retention of military work for the Albuquerque District.[40]

Had the District employees limited their petition to purely management data, the transfer might have been no more than a bureaucratic decision argued through channels. But the staff saw more at stake, and moved to assess the economic and social impact on the city and state. In a letter to David M. Cargo, the Republican governor of New Mexico, the employees fashioned a statistical analysis not unlike those they would prepare for construction of a military base

or a water project. They showed how New Mexico would lose millions of dollars in salaries, taxes, home mortgages, and consumer spending, as the transfer rippled through an economy already reeling from other military and social spending limits. The employees also disliked Fort Worth's acquisition of the high-profile military work, because this required little or no contact with the general public of New Mexico. Civil works would mean that Texans would have to manage the less-glamorous but more complex water projects of the state, something in which the District took as much pride as its military construction.[41]

The more that District employees who were slated to move contemplated their fate, the more unfair it seemed. Fort Worth had twice the working population of the city of Albuquerque and a higher standard of living, while its unemployment rate was but one-third that of the Duke City. Yet the employees also recognized the value of the intangible qualities of life in New Mexico, where people had always accepted less in financial benefit to acquire the "psychic income" of its open spaces, natural beauty, and temperate climate. Another fear maintained by the staff was the age-old ethnic tension between the native Hispanic and Indian people of New Mexico and the more homogeneous, southern mentality of Texas. The District informed President Nixon that it had "the highest percentage of employees in the minority group of any Government agency." These people had deep roots in the state, and would be reluctant to move away. When compared to the Fort Worth District's record of hiring only six percent minorities, as opposed to Albuquerque's 33 percent, the District staff became worried at the prospects of discrimination. Previous contacts with the Fort Worth District had made many New Mexicans suspicious of the Texans' commitment to equality. For this reason the District staff told the President that life in Fort Worth "leaves more than a little to be desired."[42]

Given the bitterness generated by the military construction transfer, it was inevitable that New Mexico politicians would hear from voters closely tied to federal spending for their livelihood. When Anthony Ramirez, a draftsman in the District's Design division, learned of his termination in March 1970, he contacted Henry G. Maez, owner of Maez Roofing Company and a personal friend of Governor Cargo. As a dedicated Republican, Maez felt awkward about Nixon's decision to slash the military budget. "This move shall definitely hurt our economy here in Albuquerque," said Maez, "but President Nixon must run his administration as he sees fit, and in the end it might be good for the economy of the nation.[43]

Maez's defense of Nixon's budget cuts did not extend to the Albuquerque District transfer, however. He reminded Cargo that "the Republican Administration is getting blamed for the way that the Albuquerque District set up the Organizational Chart as to who was going to stay." Maez noted that the District would keep a staff of 58 percent management and 42 percent laborers. This meant that employees with only six months to two years experience might stay, while others like Anthony Ramirez with eight years of services had to leave. "You certainly would gain a lot [politically]," Maez told the potential U.S. Senate candidate, "by looking into this situation!" The District work force was "desperate," and if the transfer "had been handled properly," said Maez, "there would be no gripes."[44]

When David Cargo, Joseph Montoya, and others could not deliver for the District personnel, the situation looked grim. District employee Ellis Easley wrote to an unannounced candidate for U.S. Congress, Fabian Chavez, Jr., to publicize the inability of the District to gain a fair hearing on the transfer issue.

As a Democrat who might oppose the incumbent Republican, Manuel Lujan, Jr., Chavez could use the transfer question in an upcoming campaign, and Easley cast his remarks in that tone. "The Corps of Engineers," he said, "is planning to practically liquidate the Albuquerque District." Easley characterized the removal of 125 employees to Fort Worth as "a fate worse than death." Because defense reductions swept across the board in New Mexico, "these people [would] be thrown onto a labor market which is not looking for their skills at this time."[45]

Easley then offered suggestions to Chavez about saving the District in spite of OCE's intentions. The nascent environmental movement, which would receive national attention that spring with the commemoration of "Earth Day," meant that the Corps could oversee programs to curb pollution of the nation's waterways. Easley also raised an issue that would echo later in the 1970s when the District faced new circumstances of realignment. "At the present time," said the concerned employee, "the Albuquerque District of the Corps of Engineers is the only one in the Rocky Mountain area." He feared that replacement of military construction functions by Fort Worth would mean that "in a few years people from Texas and Alabama will be telling us what to do about New Mexico's weather." Easley knew that Fabian Chavez had no platform from which to "exert a great deal of pressure" on the federal government, but hoped that his letter would give Chavez "a little ammunition" in case he ran for office in the next election.[46]

The Albuquerque District's quarter-century of postwar military construction revealed several things about the nature of such work, and of the District's importance to New Mexico and the surrounding area. Before 1945 the U.S. government would demobilize its armed forces immediately upon cessation of hostilities, and encourage reintegration of military personnel into the peacetime economy. Yet after World War II the U.S. military faced several difficult questions at home and aboard. The uncertainty of Soviet intentions worldwide kept the nation at a level of readiness unknown to previous generations, creating tensions over loyalty, patriotism, and the need for accelerated spending on defense. These problems affected the Corps of Engineers greatly as it attempted to meet its obligations in peace and war, and the Albuquerque District was no different in this regard.

As for the impact on New Mexico, the state would not be the same after 1945, thanks in large measure to changes effected by federal spending at its many military installations. The Corps brought to New Mexico some of the best-educated and trained engineers and scientists. The District worked closely with the physicists and technicians at Los Alamos, Sandia, and White Sands Missile Range, to perfect state-of-the-art technology in nuclear weaponry and space exploration. New Mexico's reputation as a center for technology grew from this foundation, and is the basis for projections of regional growth and prosperity for the next generation. The loss of military construction, however, revealed an important concept. No matter how vibrant the current level of work, nor how fascinating the challenges of the future, both the Albuquerque District and New Mexico would have to diversify their economic base to avoid the dependency that the boom years of military construction created. These circumstances became more evident with the completion of the District's major civil works projects in the 1970s, and tested the Corps' ability in an uncertain age.

VI

THE MIDDLE RIO GRANDE VALLEY, 1935-1955

The interruption of civil works activities caused by World War II did not eliminate the need for planning of water projects in the Albuquerque District. The rapid expansion of population in central New Mexico had strained the natural resources, like land and water. Flood hazards threatened the growing urban area of Albuquerque, and the large federal investment in the region required the attention of Congress and the Army Engineers. When this pace of change continued after the war, communities affected by wartime growth turned to Washington for additional support in matters of water resource development, This gave the Albuquerque District some of its most important civil works tasks of the postwar era. Protection of its headquarters city ranked high among District priorities, and events of these years would shape development in the middle Rio Grande valley for decades to come.

Since the early 1900s, the presence of the Bureau of Reclamation in New Mexican river basins had kept the Army Engineers from active participation in regional water policy planning. The ostensible mission of the Corps to operate only in navigable rivers excluded most western streams from their purview. Only in 1927 did Congress authorize activities of Corps throughout the West as part of House Resolution 308, which called for surveys of flood protection and hydropower facilities in all United States waterways. At the same time, the states of New Mexico, Texas, and Colorado had attempted with mixed success to fashion an interstate stream compact for allocation of the waters of the Rio Grande. The need for technical assistance to conclude this important agreement thus became the vehicle for the Army Engineers to enter the complex and challenging world of water resource development in New Mexico.[1]

By 1935 the river that held the lifeblood of central New Mexico had undergone study by the state engineer's office, the International Boundary Commission, the Bureau of Reclamation, the Department of Agriculture, the Middle Rio Grande Conservancy District [MRGCD], and private irrigation companies. Despite a massive body of statistical data, the three compact commissioners from the three affected states had doubts about the accuracy, completeness, and what the New Mexico state engineer called the "freedom from bias" in each agency's report. In this predicament the federal government intervened in the form of the National Resources Committee, a New Deal organization devoted primarily to the study of resource development in the West. Meeting twice in Santa Fe in the winter of 1935-36, the committee sought clarification by asking the Army Engineers to join the Interior and Agriculture departments as part of the "Rio Grande Joint Investigation."[2]

As a contributor to the formation of the Rio Grande Compact, the formal document on interstate stream use, the Army Engineers gained invaluable knowledge about the appropriation of basin waters, and the geology and hydrology of the region. Upon completion of these studies in 1928, the Corps also es-

tablished itself in the area through its construction work at Conchas Dam. After building this project, the Corps served in an advisory capacity to state and federal agencies such as the Works Progress Administration [WPA], which built small retention and diversion dams in rural New Mexico communities. Then in the spring of 1941, severe flooding along the mid-section of the Rio Grande brought a permanent presence for the soon-to-become Albuquerque District in matters affecting the river.

Floods on the Rio Grande and its tributaries had been a fact of life. Indian and Hispanic farmers who operated at a subsistence level adjusted to the flooding by waiting for its arrival each spring and then planting their crops in the highly fertile sediment deposited in the flood's wake. The American system of farming, however, involved massive production of surplus crops for sale in a larger market economy. This practice meant increasing the length of the growing season, the size of one's fields, and the volume of water used thereon. Spring floods then constituted a danger, not a blessing, to such organized methods of agriculture. As more settlement occurred the need for flood control grew accordingly.

The greater use of the river by farmers and city dwellers became obvious after 1900. Excessive pumping of wells in the basin had reduced the water table such that the amount of irrigated land in the middle valley had declined by two-thirds, from 125,000 acres in 1880 to less than 40,000 acres in the 1930s. Rainfall amounts varied during this period, and water-absorbing plants lined the river banks. The streambed also aggraded with yearly deposits of silt. Where farms were lower than the rising shoreline the groundwater seeped to the surface, killing the vegetation and leaving swamp and marshland behind.[3]

At first the citizens of the river valley attempted to control their water problems through formation of the Middle Rio Grande Conservancy District. After a particularly difficult spring in 1917, water users incorporated to pass bond issues that financed construction of levees, irrigation canals, drainage ditches, and later a storage pool at El Vado in northern New Mexico. Problems caused by the Dust Bowl and the Depression combined with Albuquerque's small population base and low per capita income forced the conservancy district to seek outside help. In 1938 the Soil Conservation Service made recommendations on the sediment problem, and the next year the Bureau of Reclamation conducted a preliminary survey on flood control and hydroelectric power facilities. Then in 1941, when the Rio Grande flooded almost nonstop for two months, valley residents asked the Corps of Engineers for their expertise as well.[4]

The Galveston District of the Army Engineers first responded to the flood situation on the Rio Grande because it controlled the streamflow of that river in west Texas. In 1941 a Colonel Hewett of Galveston toured the Rio Grande valley of New Mexico with Thomas M. McClure, then the New Mexico state engineer. But when the Albuquerque District opened its doors in early 1942, all work on the New Mexico reach of the river was transferred to the local office. Pressures on the new District to complete its many military construction projects left little time, staff, matériel, or money for flood protection work. The conservancy district thus had to maintain its levees throughout the war years; a task made more difficult by its precarious financial situation. Tax assessments to property owners increased dramatically, yet the MRGCD spent an inordinate percentage of its funds to repair flood damage, rather than enlarging the irrigable acreage of the valley.[5]

The crises facing the Albuquerque area disturbed many residents, not the

least being Clinton P. Anderson, then Democratic Representative from the First Congressional District in New Mexico. Elected to that body in the fall of 1940, Anderson quickly learned how officials from other states manipulated the levers of power to acquire expensive public works projects. Anderson's Albuquerque could not fund any large facilities, and the outstanding conservancy district bonds had had no takers until the federal Reconstruction Finance Corporation had purchased them in 1935.

As tales of flooding on the Rio Grande filtered back to Anderson in the spring of 1941, he watched the federal budget closely. Anderson first asked the Bureau of Reclamation to assume the conservancy district bonds, as that would free its members from the debt service on its loans. When that move failed, the Congressman learned that some western water projects, especially those funded by the Army Engineers, could be built on an nonreimbursable basis. Conchas Dam had been constructed in such a manner, and the repayment schedule for the proposed Arch Hurley Irrigation District at Conchas had received very liberal terms from the Bureau of Reclamation. Anderson did not begrudge the farmers around Tucumcari their good fortune, but he called upon "the people of Albuquerque and the middle Rio Grande valley, the newspapers of Albuquerque, and the Legislature of the State of New Mexico to get a little 'hot' on this subject." The city needed "millions more spent" on flood control, and Anderson believed that the money "ought to be spent in an area where people are already living and in distress."[6]

The flooding of 1941 helped Anderson's bill for flood protection, House Resolution 4911, to pass both houses in short order. Public Law 78-534, known as the Flood Control Act of 1941, directed the Chief of Engineers to conduct a preliminary study of the basin and its tributaries north of El Paso. Anderson also detected a potential for conflict between the Corps and the Bureau of Reclamation, the other agency working in the river basin, when he added a clause requiring both groups to develop a joint-use plan for the Rio Grande near Albuquerque. Anderson hoped to avoid echoes of the bitter dispute between the Corps and the Bureau in the Missouri River valley that threatened future funding for that region. The Bureau of Reclamation consented to study irrigation and water conservation measures, while the Albuquerque District of the Army Engineers would plan for flood control and sediment storage via levees and reservoirs.

The pace of change in the Albuquerque area caused by military spending in World War II hampered the study of the Rio Grande basin, and left Clinton Anderson in a quandary. He saw the potential for postwar economic growth in his district only if he could fashion a network of transportation and communications for Albuquerque. In his mind the federal government had the largest source of capital to invest in the city's future. If he could not overcome the obstacles of flood control and irrigation, that future stood in jeopardy. Anderson then resurrected an idea that had met opposition in the West just prior to World War II: the concept of a regional water authority. Under this scenario, Congress would develop not only flood and irrigation projects, but water recreation facilities and inexpensive hydroelectric power as well. If Anderson could convince his colleagues in Washington and New Mexico of the merits of such a plan, the federal government would underwrite nearly the entire cost of economic expansion for the middle Rio Grande valley.

To meet this urgent need, Anderson went before Congress in the spring of 1945 with a bill entitled, "Upper Rio Grande Reclamation Act of 1945." Modeled

to a great extent on the federal program known as the Tennessee Valley Authority [TVA], the legislation covered the drainage area of the Rio Grande basin from its source in southern Colorado to San Marcial, a town north of Elephant Butte Reservoir that had been destroyed by flooding in 1929. Anderson chose to work primarily with the Secretary of the Interior on this matter, giving that agency "such powers as may be necessary to carry out the purposes of this act." Construction of a hydropower plant would be a major component of any storage reservoir built on the river, since the sale of electricity would offset the costs of the projects. The Corps of Engineers would be responsible only for flood control, with all other uses of its existing projects managed by the Interior department.[7]

From his vantage point in Washington, Anderson believed that his "Rio Grande Basin Authority" [RGBA] made eminent sense. The Columbia River projects of the Corps and Reclamation in the Pacific Northwest generated large quantities of cheap power that had transformed that area into a haven for agribusiness and defense plants. The prevailing attitude among many New Deal partisians still held true in the 1940s: that national solutions were best for persistent problems of unemployment and economic stagnation. But Anderson either forgot the lessons learned by the Corps when it had advanced the ill-fated Arkansas Valley Authority in 1941, or felt that emergency conditions in wartime offered a compelling rationale for the RGBA.[8]

Soon after drafting the RGBA legislation, Anderson contacted influential backers in New Mexico for their opinions. Their near-unanimous rejection of the scheme stunned the congressman, especially since they had supported all previous measures advanced by Anderson to acquire federal spending for the state. Oscar M. Love, vice-president of the Albuquerque National Bank, told Anderson that, "development of the Rio Grande . . . is perhaps the local matter of transcendent importance to every citizen and owner of property within that area." Fred C. Wilson of the conservancy district noted that Joseph O'Mahoney, Democratic Senator from Wyoming, had pressed for similar legislation for the Upper Colorado River basin, with "construction of the works at the entire expense of the United States." All respondents to Anderson's inquiries sympathized with his objectives. But the idea of complete federal maintenance of New Mexico water resources alarmed local leaders, and they apprised Anderson of this in no uncertain terms.[9]

The critical evaluation of the RGBA proposal quickly expanded beyond the Albuquerque area to the neighboring states of Colorado and Texas. Clifford H. Stone, director of the Colorado Water Conservation Board, voiced the displeasure of his state as a member of the Rio Grande Compact Commission. Stone held that all basin authorities were "wrong in principle in every respect." Federal officials lacked sensitivity to the water laws of the various western states, and would find restrictive "the right of the states in the arid West to control the appropriation and distribution of water." Colorado discounted Anderson's claim that basin-wide management would further economic vitality, contending that the RGBA would "delay rather than expedite desirable developments."[10]

Stone did not, however, leave the Congressman without hope. The Coloradoan saw in several actions of the Army Engineers an attempt to resolve disputes in river basin planning. He recommended that Anderson study the latest flood control and rivers and harbors bill, as these guaranteed state control of water rights. Stone then warned Anderson that the Albuquerque District had to remain a strong partner in Rio Grande basin projects: "An attempt to rele-

gate them to a minor role, or eliminate them entirely from the field of water development . . . will only tend to unduly discourage and delay what is needed for the proper utilization . . . of the water resources of that area."[11]

The other participant in the Rio Grande Compact, the state of Texas, also moved to register its dissent with the Anderson proposal. Terrell Bartlett, a civil engineer from San Antonio with New Mexican clients on the river below Elephant Butte Dam, called the preliminary plans of both the Corps and Reclamation "grandiose." Bartlett had not only disapproved of the RGBA concept, but also believed that many of the proposed structures would waste money and not deliver on their promises. He called for less-glamorous, but in his estimation more effective work such as the raising of levees, dredging of the river channel for a deeper and swifter flow, and more attention paid to the problems of evaporation and sedimentation in the reservoirs under study. Bartlett's objective mirrored that of all interested Texas and southern New Mexico officials: quick and efficient delivery of all compact waters to Elephant Butte as soon as flooding occurred further north to offer lower valley farmers enough irrigation water for the summer.[12]

Under the onslaught of criticism for his basin bill, Anderson chose discretion as his method of retreat. He wrote to Thomas McClure to calm the state's fears about the intent of the RGBA. Anderson had no desire to "set up an appointive board in Washington, which knows nothing of conditions in New Mexico." Any commission for the RGBA would be "composed of people resident within the area," and would be "selected by the President [with] the advice and consent of the Senate." Anderson still considered his plan meritorious, telling the state engineer that federal control of the operations and management of any flood protection works was standard procedure throughout the West. He did admit that the impact of the RGBA on the delivery of compact waters had not crossed his mind, but promised to negotiate with the states on that point. Anderson reassured McClure that he had not sold out the interests of his state or of Albuquerque with the RGBA, and concluded that "we all know what New Mexico needs, wants, and ought to have, and our feelings are not far apart."[13]

The battle for the RGBA changed character in 1945 when Clinton Anderson resigned from his seat in Congress to accept the position of Secretary of Agriculture in President Truman's cabinet. Anderson would maintain his interest in flood control and irrigation projects for the basin. But it would be left to New Mexico senator Dennis Chavez to fulfill the expectations of Rio Grande valley water users. Chavez would assume coordination of the various plans under the aegis of the Middle Rio Grande Project [MRGP], and when he became chairman of the Senate Public Works Committee in 1949 he would exert great influence on the funding of Army Engineer projects nationwide.

As a lifelong resident of the Rio Grande valley, Dennis Chavez knew firsthand the problems of flood control and sediment protection. His family lived in the small community of Los Chavez, south of Albuquerque, where the Senator developed his understanding of the New Mexico Democratic party and its important Hispanic component. Clinton Anderson often spoke for the business and professional interests in New Mexico, given his background as a journalist and insurance agent who had come west to Albuquerque in 1917 to recuperate from tuberculosis. Dennis Chavez, on the other hand, paid close attention to the concerns of small farmers and landowners throughout the valley, and knew that they too must share in any improvements brought by the Army Engineers and other federal agencies. David M. Cargo, former Republican governor of New

Mexico [1967-71], characterized Chavez's perspective on water policy as "practical dreams," and it was Chavez's diligence and consensus-building in Congress that often carried the day for the Rio Grande basin.[14]

Prior to 1945 Dennis Chavez had devoted his energies in the Senate to acquiring military contracts for the state, and New Deal social programs for his constituency. His forays into water development consisted of support for funding of Conchas Dam in 1935, and introduction of bills to construct small flood protection works in northern New Mexico. But the RGBA debate brought Chavez into the picture, as he agreed to write an article on the issue for the *New Mexico Quarterly Review*. The senator also worked on passage of the Flood Control Act of 1944, which added several tributaries of the Rio Grande to the original Corps study. This legislation also called upon such disparate federal agencies as the Federal Power Commission, U.S. Fish and Wildlife Service, National Park Service, Bureau of Indian Affairs, U.S. Forest Service, and Soil Conservation Service to join the Albuquerque District and the Bureau of Reclamation in developing a comprehensive basin report.[15]

The deliberative pace of the federal bureaucracy irked the activist Chavez, especially when the MRGP report did not surface in time for the off-year congressional elections of 1946. The evident backlash against Democratic social programs, postwar inflation, and the suspected Communist menace of the Cold War made Republican fortunes bright that fall. Chavez saw two problems on the horizon, one for himself and the other for the MRGP. His re-election campaign pitted him against Patrick W. Hurley, Secretary of War under President Herbert Hoover, Ambassador to China under Franklin Roosevelt, and a former general in the U.S. Army. In addition, a Republican sweep of the Senate might doom federal support for western water projects, since budget-cutting and criticism of "big government" provided the Republicans with ammunition in all contested races.

To deflect the attacks of Hurley, et al., and to insure the success of the MRGP, Chavez made an issue of alleged Republican insensitivity to public works and social programs. He released an unsigned statement on the eve of the election warning New Mexico voters that Senator Carl V. Hayden, an Arizona Democrat who championed western water projects, could be replaced as chairman of the powerful Appropriations Committee by Senator Styles Bridges, a Republican from New Hampshire. Chavez depicted Bridges as "a reactionary easterner" who knew "nothing of the West." By inference Chavez painted his New Mexico senatorial opponent with the same brush. To save Hurley's candidacy, Bridges responded immediately by telegram to the *Albuquerque Tribune*. The New Englander reminded New Mexicans that a Republican, Theodore Roosevelt, had supported funding of Elephant Butte Reservoir in 1906, and that as Secretary of War Hurley had authorized the Corps to conduct surveys of the middle Rio Grande valley. Bridges had visited New Mexico on several occasions, and assured *Tribune* readers: "I have been and am now in favor of flood control that will protect the magnificent city of Albuquerque . . . and I shall be very glad to work with you [Dennis Chavez], Pat Hurley, and all others interested to that end."[16]

Although Chavez escaped defeat in 1946, he and the Democrats did lose control of the U.S. Senate that year, and had to wait until the Truman upset of 1948 to regain their positions of power. Once back in command of the Congress, the party named Chavez to head the Public Works Committee. In the summer of 1949 he received the long-awaited Rio Grande report from the Sec-

retary of the Army, and moved for quick action on its recommendations. The report, known as *House Document No. 243,* 81st Congress, 1st session [HDoc 243], did call for extensive construction in New Mexico, but also revealed the complexity of water management in the Southwest.

No less than five federal agencies worked on HDoc 243, along with the Rio Grande Compact commissioners for New Mexico, Texas and Colorado. The Flood Control Act of 1948 had authorized several projects, the most prominent being Chamita Dam above Espanola, Jemez Canyon Dam above the town of Bernalillo, and flood protection for the middle Rio Grande valley. The act also recommended projects to control the heavy sedimentation of the river, and to upgrade the present irrigation systems to gain efficiency. Federal officials took notice of the memorandum of agreement signed between the Interior secretary and the Chief of Engineers on 25 July 1947. This statement delineated the areas of responsibility for the Corps and Reclamation in the Rio Grande basin. The director of the Bureau, Frank Pace, Jr., hailed this cooperative posture and commented: "It is gratifying to note the high degree of coordination . . . [B]oth agencies are deserving of commendation for such an achievement."[17]

Despite these words of praise, the Budget director also could not ignore the deficiencies in the report. Many of the agencies involved, including the Park Service, Bureau of Indian Affairs, the Geological Survey, and Soil Conservation Service, had yet to file their comments, depriving the 1949 survey of sufficient data on soil erosion and retention of silt. Colorado and Texas expressed concern over the amount of water stored in the basin and the operation of the proposed facilities, while New Mexico worried about meeting its delivery schedule to Texas under the Rio Grande Compact. But of all the aspects of the MRGP study, the most objectionable was the proposed flood control dam and reservoir at Cerro Chiflo, north of Questa on the upper reach of the river.

Colorado water authorities paid special attention to the Albuquerque District's plans for Chiflo Dam. Their estimate of the savings offered by the facility showed that Chiflo would cost three times as much to maintain each year [$1.26 million] as it would offer in flood protection benefits [$384,000]. The damsite would be too far north of Elephant Butte Reservoir to effect sedimentation control, because only one percent of the the basin's silt flowed past Chiflo. Forty percent of the floodwaters of the Rio Grande came from the Rio Chama above Espanola, and the Army Engineers did not plan to advance construction on that stream in the near future. To help cover the costs of building Chiflo Dam, the Corps had suggested placing hydroelectric power works at the site. Colorado feared that storage of water at Chiflo would endanger similar plans for the San Luis Valley project, authorized in 1940 and as yet unfinished. Finally, Colorado was not sure that the Rio Grande Compact would permit waters to be stored for long periods that far north. The damsite had not been thoroughly tested for water-tightness, said Colorado, while seepage into underground wells could drain away the flow that needed to remain in the channel.[18]

Criticisms of Chiflo disturbed Senator Chavez, who had pushed for its construction by the Albuquerque District. Chavez saw the project as providing a multipurpose water resource facility for the Hispanic farmers of the Taos-Questa region of northern New Mexico, and especially as a source of low-cost electricity for an area among the poorest in the nation. As negative commentary built on the subject of Chiflo, it loomed as a threat to the funding of the entire basin project. To limit the damage, Chavez sent word to the Albuquerque District that no employees engaged in drilling core samples at the site were to discuss their

work with the general public. The final version of the 1949 report requested that Congress remove Chiflo Dam from the overall planning, either to be replaced with a dam near Jaroso, Colorado, or to be eliminated altogether.[19]

Regardless of his preferences on Chiflo, Dennis Chavez believed that the entire MRGP had to be enacted quickly to spare central New Mexico the devastation of 1941. The opportunity to employ hundreds of workers at salaries comparable to World War II wages also spurred the senator, in that the postwar recession had proved long-lasting for unskilled and semi-skilled laborers in New Mexico. Even before the Army Engineers' report became public, Chavez called upon the newly seated Eighty-First Congress to enact legislation giving Reclamation and the Corps a combined national budget of $53 million for new water projects. Of this, over $1.2 million would be needed for starting the MRGP.[20]

Senator Chavez realized that his proposed legislation might confuse many senators not supportive of western water projects, and resorted to a variety of tactics to gain approval for his measure. He drummed up testimonials from the Santa Fe Railway to prove his contention that Rio Grande basin flooding disrupted communications and transportation almost every spring. The railroad even composed a two-page handbill detailing all major floods on the river since 1874, listing crop and track damage, loss of life, and costs of repair. Major General Kenneth D. Nichols, Chief of the Special Weapons Project at Sandia Base in Albuquerque, informed Chavez that any loss of services would hinder the work of the nuclear missile program there. Similar commentary came from David Lilienthal, former director of the Tennessee Valley Authority and then-chairman of the United States Atomic Energy Commission. Lilienthal worried about "rail, air and road communication for both Los Alamos and Sandia Laboratories." The railhead at Albuquerque had to be protected, so that shipments of uranium products and nuclear devices met no harm.[21]

Encouraged by these letters of support, Chavez then called upon Albuquerque municipal water officials to testify before his committee. John P. Murphy, executive secretary of the Middle Rio Grande Flood Control Association [MRGFCA], offered his services to Chavez as a witness. This organization had just been formed by Oscar Love to arrange financial support for flood control projects with the Albuquerque District. Chavez responded with recommendations for Murphy's remarks to strengthen the case of the MRGP. "Although the Corps of Engineers will be represented," said the chairman, "and will furnish technical data, I believe it would be very much to your advantage [to] be reasonably well posted on such several matters pertaining to the physical aspects of the river and its problems." Committees that held lengthy hearings were often "much more favorably impressed with clear, concise statements," and Murphy should not read from a prepared text if at all possible. Chavez needed Murphy's statement to justify another increase of $3.5 million for the first phase of the MRGP, and Chavez knew that Murphy would "be questioned somewhat extensively on almost any aspect of the project."[22]

The New Mexico efforts to fund construction of the MRGP went for naught in 1949. Chavez then prepared new legislation to increase nationwide water project funding to $60 million, which included $750,000 for preliminary studies of Jemez Canyon Dam. Chavez scheduled hearings of his Public Works Committee in the state on 9-19 January 1950. The group would visit Carlsbad and Roswell, observing the work of the Albuquerque District in the Pecos River basin. From there committee members would adjourn to Albuquerque, where they would be confronted with the necessity for the MRGP.

The session with the Senate committee convinced Chavez, the Corps, and local proponents of the MRGP that Jemez Canyon Dam offered the best hope of initial construction of flood protection works for the Albuquerque area. Its proximity to a metropolitan center, its large storage capacity, and its modest price tag of $7.2 million made it easier to pass through Congress that the $27 million needed for the defunct Chiflo site, or the $28 million being discussed for Chamita Dam near Espanola. On 4 May 1950, the Albuquerque District awarded a contract for construction of an access road and outlet works at Jemez Canyon, amounting to $236,000. Chavez and the Corps congratulated themselves on this good fortune, and could almost ignore the decrease in the fiscal year 1951 budget for Jemez Canyon Dam from $1 million to $500,000. The project had begun, and Congress rarely halted production of a facility once monies had been expended.[23]

As the New Mexico congressional delegation pressed its case for Jemez Canyon Dam in Washington, events far away in East Asia threatened another round of budget cuts and termination of the MRGP. In the fall of 1950 President Truman committed U.S. military forces to the growing conflict between North and South Korea. While this action meant additional authorizations for military branches of the Albuquerque District, it also drained away staff, materials, and funds from the civil works segments engaged with Jemez Canyon Dam. The risks of flooding did not abate, nor did the rate of sedimentation decrease in the Rio Grande basin. Yet the war effort led many in Congress to scrutinize more carefully all non-military portions of the budget. As funds for water projects shrank, interagency disputes over jurisdiction threatened whatever public works money Congress did appropriate. In the face of such conflict, Dennis Chavez fought for any and all funds he could get for the MRGP.

The prevailing mood of economizing in government in the early 1950s resurrected interagency disputes over water projects that had lain dormant during the years of rapid growth and increasing expenditures. The culprit in the eyes of the Corps was the Bureau of Reclamation, whose constituency resided within the 17 western states served by that organization. While the Albuquerque District had reached a compromise with Reclamation in the Rio Grande Basin, differences of opinion about missions and delivery of services emerged during the years of the Korean War. The Albuquerque District was not alone in this regard, and the crisis prompted General Samuel D. Sturgis, Chief of Engineers, to draft a statement of concern about similar feuding nationwide.

Convinced of the wisdom of the Corps' approach to water policy in the West, and believing that Reclamation operated within a more narrow framework, Sturgis spoke bluntly about the future relationship between the agencies. "Differences are usually not technical," the Chief acknowledged. They stemmed from the "more nebulous realm of the political or social philosophy of water resource development." Sturgis viewed Reclamation's goal as "greater centralization authority" over western water. In doing so the Bureau moved "with the trend of the time . . . during the Roosevelt and Truman administrations." To his way of thinking, the Corps did not commit this sin of "empire-building." The Army Engineers had "followed a fairly consistent course of recognizing local and state rights," the Chief contended, "of federal participation rather than control; and of leaving policy making in the hands of Congress."[24]

Sturgis then outlined several areas where Reclamation appeared to overreach its legislated authority. These included its desire to utilize all waters in Corps flood control reservoirs for irrigation; management of its own flood protec-

tion facilities; and attempts to appropriate hydroelectric power from Corps projects to sell to its own customers, in order to funnel the proceeds into the Reclamation fund rather than to the U.S. Treasury. Sturgis listed a number of western river basins where conflict had already surfaced, using as an example the 1947 agreement between Reclamation and the Albuquerque District. Giving Rio Grande channel rectification to the Bureau, Sturgis felt, was a "shotgun affair;" a reference to a forced compromise. Sturgis suspected that New Mexico politicians had wanted to placate Reclamation when they knew that the bulk of Rio Grande projects belonged with the Corps. "This is actually our type of work," the Chief concluded, leaving no doubt as to the nature of the Corps-Reclamation relationship.[25]

Frayed nerves all around involving the MRGP reached their peak when colleagues of Dennis Chavez, and finally General Sturgis himself, took the senator to task for his handling of the affair. Senator Guy Cordon, a Republican from Oregon, disliked Chavez's attempt in 1952 to revive the Jemez Canyon Dam funding cuts without the support of the Bureau of the Budget. Having listened to a series of witnesses lamenting Albuquerque's fate without flood protection, Cordon interrupted the testimony of Corps officials to exclaim: "It seems to me that [the MRGP] cried loud for the earliest possible action at the earliest possible minute. I cannot understand why work was not commenced the minute there was authorization."[26]

The Army Engineers in Washington mirrored Cordon's frustration at the lack of progress in the Rio Grande basin, and adopted countermeasures to deflect future criticism. By late 1954 General Sturgis had tired of the inability of the MRGP supporters to deliver local funding and land purchases. Sturgis vented his frustration at Dennis Chavez by asking his aides, "What risks have we accepted in going along with Senator Chavez?" The Chief of Engineers doubted that the senator realized the complexity of all the legal, financial, political and bureaucratic tangents of the MRGP, and told his subordinates no longer to assume "a position of caution" with the New Mexican.[27]

This rift between the Public Works committee member and the Chief of Engineers did not surface in public, and its effects on New Mexico cannot be measured readily. In the federal budget for fiscal year 1952, Chavez inserted $900,000 for completion of the outlet at Jemez Canyon Dam, despite House Appropriations Committee wishes for no monies at all. Chavez then joined with Senator Clinton Anderson to gain $2.1 million for the bulk of the construction. The Albuquerque District began closing the 136-foot high dam in August 1952, and two months later had opened the sluice gates for testing. Once completed, the dam stretched 780 feet across the canyon, and contained 120,000 acre-feet of flood and sediment control storage. The fight for Jemez Canyon Dam had ended, leaving interested observers to wonder at the acrimony and intrigue awaiting later components of the Middle Rio Grande Project.[28]

With completion of Jemez Canyon Dam, the Corps could direct its attention to the challenges of the remainder of the MRGP: high dams at Chamita and Abiquiu, and a floodway through the city of Albuquerque. Several smaller items remained for Jemez Canyon Dam, not the least being $310,000 for flood protection levees for the Pueblo of Santa Ana, directly upriver from the dam. The Santa Ana people had granted easements to the Army Engineers in return for protection from the retention of water at flood stage. When an abnormally high spring runoff created the need for nearly 70,000 acre-feet of flood storage behind the dam in 1958, pressure from Albuquerque residents mounted for mainte-

nance of the pool to provide recreation. H. Cook's sporting goods store, the only local dealer in motorboats, sold over 100 pleasure craft while the Corps held the water of the Jemez River in check. But permanent storage would mean damage to Santa Ana farm and grazing lands, and violation of the Rio Grande Compact delivery schedule of excess waters to Elephant Butte Reservoir. Albuquerque was still without a recreational pool nearby; a situation that would continue until completion of Cochiti Lake by the Albuquerque District in 1973.[29]

The work of the District in the middle Rio Grande valley would solidify its position as a major contributor to New Mexican water resource development. The early flood control facilities at Jemez Canyon Dam would prompt other construction at Abiquiu and Cochiti Dams, and the Albuquerque Diversion Project in the 1960s. The participants in the debate over federal funding would pursue these projects, adding their voices to the environmental movement. But New Mexico's political and economic leaders believed that the expansion they desired could be achieved only through federal involvement on a large scale. This would mean a permanent place for the Albuquerque District as the decades of the 1960s and 1970s advanced.



Plate No. 23. Gate City Housing Area, Conchas Dam (Painting by Odon Hullenkremer)



Plate No. 24. East Face of John Martin Dam, Colorado, 1985



Plate No. 25. Pecos River at Santa Rosa Dam, New Mexico, 1985



Plate No. 26. View of Trinidad Dam at Base of Sangre de Cristo Range, Colorado, 1985



Plate No. 27. Aerial View of Stilling Base at Conchas Dam, New Mexico, 1985



Plate No. 28. View of Cochiti Dam and Reservoir, East of Jemez Mountains, New Mexico, 1985



Plate No. 29. Aerial View of Galisteo Dam, South of Santa Fe, New Mexico, 1985



Plate No. 30. Abiquiu Dam and Reservoir, New Mexico, 1985

VII

THE RIO CHAMA AND ABIQUIU DAM

The political and economic problems surrounding the Middle Rio Grande Project did not end with the successful completion of Jemez Canyon Dam. That facility represented only the first phase of a $75 million development plan for flood protection and water conservation in the Rio Grande Basin. Even as Jemez Canyon Dam neared completion, New Mexicans turned to a more challenging task for the Albuquerque District: controlling the flow of the largest tributary in northern New Mexico, the Rio Chama. The volume of water, the cost of construction, and the political intrigue connected with this next project multiplied the cost figures for Jemez Canyon Dam several times over, and tested the District's ability to overcome engineering and legal obstacles in the Rio Grande watershed.

The Flood Control Act of 1948 had recommended construction of a flood and sediment storage facility six miles northwest of the town of Espanola, New Mexico. This was just above the junction of the Rio Grande with the Rio Chama. Originating on the New Mexico-Colorado border, the Rio Chama flows some 100 miles southward. For much of its distance the Chama flows through high mountain valleys, making it a favorite of trout fishermen and white-water enthusiasts. The stream also courses through areas rich in historical significance. Several early 17th century Navajo sites were located by archeological teams surveying the proposed reservoir for Abiquiu Dam. The community of Abiquiu, from which the project gets its name, was at times an Indian and Spanish farming village, and the agency headquarters for the Jicarilla Apaches and Southern Utes. Kit Carson, the mountain man and army scout for John C. Fremont, served as Indian agent at Abiquiu for a time, and in more recent years the area has been the home of the famed Southwestern artist, Georgia O'Keeffe.

When the Albuquerque District first contemplated a water project on the Rio Chama in the 1940s, it was assumed that any such facility would be secondary to a reservoir and dam on the mainstem of the Rio Grande. For that reason the Corps planned to supplement the flood and sediment protection of Chiflo Dam with a project known as Chamita Dam. The 1948 legislation authorizing the latter also removed Chiflo from consideration and demanded reassessment of the plans for Chamita. The District now considered the Rio Chama facility as its central factor in Rio Grande basin protection, requiring a larger structure and storage capacity.[1]

Upon completion of the survey of the Rio Grande mandated in the Flood Control Act of 1941, the Albuquerque District reported its findings to the three member states of the Rio Grande Compact Commission. The opposition of the water users below Elephant Butte Dam in New Mexico and Texas to the Chiflo site did not extend to the proposal for Chamita Dam, in that the latter offered more protection for heavily populated stretches of the river. But Texas, the

major critic of Chiflo, questioned the District's need for 945,000 acre-feet of flood and sediment control at Chamita. Beauford H. Jester, Governor of Texas, informed the Secretary of the Army that "reservoir capacity has been unduly stressed and channel capacity not fully exploited." As with Chiflo and later Jemez Canyon, Texas wanted as much water sent downriver as the levees would allow. For that reason water officials in his state informed the governor that Chamita should hold not more than 400,000 acre-feet of flood storage and 180,000 acre-feet of sedimentation. Whatever the size of the pool, said Jester, all operations should be in accordance with the delivery schedules of the Rio Grande Compact.[2]

As in the case of the Chiflo project, the Water Conservation Board of Colorado joined Texas in criticism of Chamita Dam. With the deletion of Chiflo from the MRGP, Chamita would be reduced considerably in size and purpose. Part of Chamita's 945,000 acre-foot capacity would serve hydroelectric power needs in northern New Mexico, with Chiflo as the main generating station. Without that structure, Colorado believed that Chamita alone was an uneconomic source of power, and thus could be limited to 500,000 acre-feet of storage. Colorado also feared that Chamita would distort the releases of water to Texas users south of Elephant Butte Reservoir. In so doing Colorado waters transmitted through New Mexico would be lost through irrigation and evaporation, leaving Colorado vulnerable to legal action from Texas despite her innocence in the matter.[3]

The arguments of Texas and Colorado regarding projects on the Rio Chama revealed a problem facing the Albuquerque District that persisted over three decades. In 1948 the District had existed less than seven years, and had yet to complete a major facility on the Rio Grande. The Corps' practice of rotating its district engineers in office every two to three years meant that the leadership would be unfamiliar with the nuance and subtlety of western water usage and law. Finally, the majority of the District's division chiefs had worked in other Corps offices where semi-arid environments, Hispanic and Indian irrigation, and the western dislike of federal interference had not been major concerns. All these factors would enter the planning and construction debate over Chamita and its successor, Abiquiu Dam, making that facility extremely complex in its operations and its utility to the MRGP.

The District realized the seriousness of the Chamita situation when it submitted its proposal for construction to Congress on 5 April 1948. Texas, New Mexico, and Colorado agreed that only one dam would be built on the Rio Chama, at a site tested by the Bureau of Reclamation soon after World War II. The states concurred in the 945,000 acre-foot pool, but also requested an uncontrolled spillway structure to meet the stipulations of the Rio Grande Compact. New Mexico was in debt to Texas for annual deliveries of water, and the compact forbade any permanent storage reservoirs on the mainstem or its tributaries until New Mexico accrued credits with its southern neighbor. By eliminating the spillway gates from Chamita, the capacity of the structure decreased to 700,000 acre-feet. Public Law 80-858 [the Flood Control Act of 1948] accepted these arrangements between the compact states and the District. Then in 1950 Public Law 81-516 authorized the Corps to expend $39 million on the entire MRGP, with the bulk of funds for construction of Chamita Dam.

When the Albuquerque District began its study of the Chamita site, it uncovered the existence of several problems. Original plans called for an earthfill structure 205 feet in height and 4,800 feet across the Rio Chama for the dam,

with 442 feet for an ungated spillway. The storage capacity for flood waters and sedimentation totalled 687,000 acre-feet. The Bureau of Reclamation had dug a trench at the site several years earlier for a possible irrigation facility, and the Corps had appropriated the location and enlarged its potential size. The new studies revealed that abutments to the dam on either bank of the Chama could be made watertight only at prohibitive cost. Because the District faced cutbacks in civil works funding resulting from the Korean war, the fight for Jemez Canyon Dam, and the excessive workload in military construction, the prospects for Chamita dimmed as the estimated costs soared from the initial $26 million in 1948 to $36 million in 1952. Budget cutters in the Truman and Eisenhower administrations blanched at the 40 percent increase in Chamita Dam, and requested new figures in 1953 to reconsider the project.[4]

Given the realities of the budget situation, the need for flood protection in the middle Rio Grande basin, and the topography of the Chama valley, the Albuquerque District had to move quickly to salvage its authorized funds for Chamita. The Corps looked northward some 25 miles upstream from Chamita at a site recommended by the Bureau of Reclamation in 1947 for irrigation storage. The location had high canyon walls, a large flood plain for a reservoir, and a natural "saddle" or crescent-shaped formation to anchor a high dam. Naming the site for the nearby village of Abiquiu, District planners suggested that a structure could be installed for less than half the cost of Chamita. Its use of natural features also permitted far more storage capacity than Chamita. The latter site would still be necessary, however, as the Rio Ojo Caliente entered the Chama below Abiquiu, and required a facility to capture its flood flows.[5]

The Albuquerque District announced its findings to the members of the Rio Grande Compact Commission in September 1953 as part of the "Chamita Dam and Reservoir Summary Report on Site Selection and Economic Aspects of Alternate Projects Considered." The District envisioned one dam at Abiquiu to be 1,400 feet in length, made of earthfill 318 feet above the streambed, with an uncontrolled spillway conduit 100 feet wide. The reservoir behind Abiquiu Dam could retain 1.26 million acre-feet for flood and sediment control, at a cost of $11.6 million. Complementing the Abiquiu structure would be the "Low Chamita Dam," named for its reduced size and capacity. This portion of the project would be 5,700 feet long [about 500 feet more than the original dam], and would be lowered to 148 feet above the riverbed, a drop of nearly 60 feet. Low Chamita could retain 251,000 acre-feet itself, making the entire Rio Chama storage volume slightly more than 1.5 million acre-feet, more than double the amount in the 1948 authorization. The District estimated Low Chamita's costs at $14.6 million, and the combined structures would need $26.3 million for completion.[6]

The new plans for Abiquiu and Chamita Dams appeared to meet the criteria established by Truman's Bureau of the Budget. The Albuquerque District had increased storage on the Chama by 100 percent, and in the process lowered construction costs to the original figure agreed upon in 1948. These accomplishments, however, did not account for the realities of Southwestern water law. The resulting changes demanded by the state of Texas transformed the Abiquiu project into a legal nightmare for the Corps and the state of New Mexico. Louis Scott, Texas commissioner for the Rio Grande Compact, immediately protested to the Albuquerque District that the new projects violated the 1948 Flood Control Act and the compact legislation. Congress had not approved such changes, said Scott, and his state would not support any future alt-

erations without proper consideration of the views of Texas.

The opposition of Texas irritated the District Engineer, Colonel Lynn C. Barnes, who believed that the Corps could be trusted to keep only 700,000 acre-feet of flood waters behind the two Chama projects in compliance with the 1948 agreements. Texas added to the tensions by demanding adherence to the construction of an ungated spillway so that New Mexico would meet its compact obligations, rather than retaining excess runoff for use in the middle Rio Grande valley. After several sessions between the District and the compact members, the Corps agreed to seek funding of Abiquiu with two gates: one controlled at the base of the structure for normal releases, and the other uncontrolled, channeling all waters above the level of 562,000 acre-feet into a tunnel for release downstream. This latter gate limited the size of the pool at Abiquiu to meet the requirements of the 1948 Flood Control Act, and to ease Texas' fears that it would not receive all available waters. The added gate increased the cost of Abiquiu by an estimated $950,000 in 1954, and drew down significantly on the $9 million the District hoped to save by redesigning flood protection on the Rio Chama.[7]

Whatever its misgivings, the Albuquerque District supported the agreement with Texas on the Abiquiu gate in its requests for Congressional funding. But problems surfaced in the work itself that jeopardized future appropriations and the construction schedule. Local Hispanic landowners refused to sell their properties at the assessed value, requiring the District to initiate condemnation proceedings; a move that guaranteed strained relations and doubled the original estimate of land acquisitions to $2.5 million. Other costs increased the total project budget to $31.6 million in 1956, a 20 percent advance in less than three years. Then the District received yet another setback when it opened bids on the first phase of construction, the controlled outlet works. All three proposals came in at a level described by the District Engineer as "considerably in excess of the Corps of Engineers estimate." Colonel Robert E. Cron, Jr., head of the Albuquerque office, sent the lowest bid to OCE for appraisal, delaying the schedule of work. When OCE rejected the offer as too high, the District started the bidding process all over again.[8]

The circumstances afflicting the Abiquiu project began to take their toll on the various participants, and the heightened tensions of later years can be traced to decisions made by the Supreme Court, Congress, and the White House staff in the late 1950s. When drought conditions in the early years of the decade joined with the exploding population of the middle Rio Grande valley, the resultant demand kept New Mexico from meeting its delivery schedule of water to Elephant Butte Reservoir. In order to force New Mexico to increase its shipments of water, the state of Texas appealed to the U.S. Supreme Court in 1951 for redress. As the case of *Texas v. New Mexico* worked its way to a final conclusion, New Mexico fell further behind until its debt to Texas neared 500,000 acre-feet. New Mexico earned a reprieve of sorts in February 1957 when the Supreme Court dismissed the Texas suit. The justices held that the Lone Star state had ignored the presence of the federal government in Rio Grande water policy, specifically with the Bureau of Reclamation as manager of irrigation facilities for the Middle Rio Grande Conservancy District, and the Bureau of Indian Affairs as trustee of Pueblo Indian lands throughout the basin. The opinion did not spare New Mexico, however, as U.S. Senator Lyndon B. Johnson and Representative J. T. Rutherford, both of Texas, introduced legislation making the United States a party to any further suits involving the compact, but denied to

the Supreme Court the power to authorize damages against the government in any adverse decisions.[9]

The defeat of Texas in the case concerned Texas water officials about future projects, and of the role of the Albuquerque District therein. Responding to the Bureau of the Budget in 1956, the Corps informed the President's fiscal advisors that an uncontrolled outlet at Abiquiu served no useful engineering purpose. The alterations had the support of OCE only because of Texas' insistence. This testimony entered Report No. 747 of the 1956 Public Works Appropriations bill of the House. Congress instructed the Albuquerque District to plan Abiquiu Dam without the uncontrolled gate. The District concurred, leading Texas to claim collusion between the Corps and New Mexico water officials. Steve Reynolds, New Mexico state engineer, informed Texas that his office viewed the controversy as a "policy matter," and called for both states to accept the judgement of Congress. Privately, Reynolds agreed with the perspective of the Middle Rio Grande Flood Control Association that the commotion raised by Texas water users was unwarranted. New Mexico would live up to its obligations, and resented Texas impugning its integrity or that of the Albuquerque District.[10]

The chain of events surrounding the Abiquiu gate controversy stirred discontent among New Mexico residents interested in the progress of the dam. Joe Lawler, managing editor of the *Santa Fe New Mexican,* asked Representative John J. Dempsey to explore the problems at Abiquiu so that his newspaper could report the facts in a coherent manner. Dempsey sought information from Major General Emerson C. Itschner, Assistant Chief of Engineers for Civil Works, who told the Congressman that "overall project economy," rather than "any considerations of storage capacity," dictated the deletion of the uncontrolled spillway gate. That did not satisfy the *New Mexican,* which ran a feature story and editorial condemning the "Tejanos" who manipulated Congress and the Corps to New Mexico's disadvantage. Tony Hillerman, editorial page editor, called the gate "a million dollar monument to distrust." Major General Lyle E. Seeman, Southwestern Division Engineer, told the *New Mexican* editor: "I think the people down the Rio Grande are a little distrustful of you people up there." Seeman estimated that Abiquiu would not exceed the flood control pool level "once in fifty years," and that the controlled gate could release all waters efficiently at much less cost. Hillerman labeled the whole idea as a "boondoggle," and touched the nerve of many northern New Mexicans by asking: "Do these upstart Tejanos, who don't deserve the water in the first place, think we're not only dishonest but stupid as well?"[11]

While local interests and Texas sparred over the Abiquiu flood gates, the Albuquerque District awarded its first construction contract on 24 August 1956. It became obvious that Abiquiu Dam would be the only structure on the Rio Chama supported by Congress. To protect the future of Abiquiu, especially in the face of rising costs, the Albuquerque District terminated study on the Lower Chamita Dam after completion of 60 percent of the design work. All project funds went to hasten the work at Abiquiu, minus the uncontrolled gate which had ballooned to $1.4 million by the year 1959. The House Public Works subcommittee took special note of the political and economic turmoil of Abiquiu, and asked OCE representatives for yearly updates. Even with the deletion of the extra gate, the District had to revise its Chamita savings projection downward to $5 million, citing the cost of building the structure with more expensive earthfill than that immediately available at the site.[12]

The multitude of problems involved with Abiquiu kept most New Mexicans

unaware of logistical and engineering feats accomplished by the Albuquerque District and its prime contractor, Mittry Construction Company of Los Angeles. Frank K. Mittry and his crews confronted several hurdles in their quest to build what one publication believed was the highest earthfill dam the Corps had attempted. Materials had to be borrowed from soil deposits over 1.5 miles away. The clay content of the Abiquiu area when moistened became very sticky and hard to process, and the steep cliff walls challenged conventional earthmoving equipment. Mittry fashioned several pieces of equipment considered revolutionary for their time, including a 4,300-foot long conveyor belt that rose 130 feet in its journey from the borrow pits to the receiving hopper. Mittry also built a huge excavator carrying six large buckets that could gouge out eight cubic yards of dirt per revolution. This "Mittry Mole," as crew members called it, attracted so much attention that its inventor had to incorporate a separate division of his company to market the product to other contractors working on western water projects of the magnitude of Abiquiu Dam.[13]

As the work crews moved rapidly on Abiquiu, the debate over the uncontrolled spillway also reached new heights. In hearings before Congress on the 1959 budget, the Corps accepted the judgement of the House Appropriations Committee to remove the gate structure immediately. Hydraulic studies indicated that the District could not link the controlled and uncontrolled gates together, and the topography of Abiquiu canyon did not preclude addition of the latter component in the future. The Texas delegation protested loudly against the Corps' decision, reminding the Public Works subcommittee of the legal restrictions on Abiquiu storage. Senate Majority Leader Johnson petitioned the House to include funds for the uncontrolled gate in the 1960 budget, fearing that deletion with the project in an advanced state meant a loss of Texas authority in Abiquiu operations.[14]

With the gate problems seemingly solved, the Albuquerque District focused on completion of the Abiquiu project and assumption of new tasks. In the Flood Control Act of 1960 Congress officially removed Low Chamita Dam from the District's work schedule. The proposed structure had threatened to double expenditures on the Rio Chama, and monies were needed for protection in the Rio Grande closer to Albuquerque. On 5 February 1963, the District officially closed the gates at Abiquiu Dam, and began filling the reservoir to its maximum elevation of 6,089.2 feet above sea level. At its completion the dam stood 325 feet long, and nearly 2,700 feet at the streambed from "heel" to "toe." The District acknowledged in its annual report for 1963 that Rio Grande Compact agreements limited storage to 562,000 acre-feet, even though the reservoir could retain 1.2 million acre-feet if necessary. Conclusion of the final contract work brought total expenditures to $20.3 million; a savings of 40 percent over the original Chamita plans, but an increase nonetheless of $8 million from the first estimates at Abiquiu.[15]

Almost from the moment that the Albuquerque District closed the gates at Abiquiu Dam in 1963, the project became involved in debates as complex as those of the 1950s. The potential for water recreation and fishing piqued the interests of residents of Santa Fe and Los Alamos. When members of the Espanola Valley Chamber of Commerce learned that Abiquiu could not legally store water on a permanent basis, it petitioned Congress to amend the Rio Grande Compact. In a memorial entitled, "Abiquiu Dam — Recreational Area? Or Mud Hole?" the chamber noted the high rate of unemployment in the area, and the potential for economic development around a large body of water. The *Santa Fe*

New Mexican supported the petition, and referred to the state's time-honored animus against Texas by lamenting their careful scrutiny of Abiquiu waters.[16]

In order to gain acceptance of their proposal, citizens from Espanola and Los Alamos asked the New Mexico state engineer for advice on the prospects for recreational storage behind the dam. Steve Reynolds informed them that the compact prohibited the use of basin waters for any permanent pools while New Mexico remained in debt to Texas on water deliveries. Reynolds did not dismiss the Abiquiu case, however. Looming on the horizon was authorization of the San Juan-Chama Transmountain Diversion Project. Modeled on facilities such as Colorado's Big Thompson and Frying Pan-Arkansas projects, San Juan-Chama would bring waters from the west slope of the Continental Divide through a network of tunnels to supply irrigators, municipalities, and industry in the Rio Grande basin. Senator Clinton Anderson, a moving force behind the San Juan-Chama project, envisioned growth for central New Mexico, and especially for Albuquerque, should a stable supply of new water become available.

When the San Juan-Chama project became operative in the early 1970s, Reynolds predicted that the water users of northern New Mexico could store some of its water behind Abiquiu for temporary recreational usage. As for more permanent storage, the City of Albuquerque could be approached to "lend" some of the excess water it held upstream for use in the distant future. New Mexico law required water rights holders to put their resources to the "most beneficial" use. If Albuquerque did not do so with its San Juan-Chama water, downstream users in the Colorado river basin could claim it permanently. Anderson had guaranteed Albuquerque up to 400,000 acre-feet of San Juan-Chama water by the year 2000, and Reynolds believed that Abiquiu, with its excess capacity, could easily handle the overflow.[17]

The plans for permanent storage moved forward despite the opposition of local farmers, environmentalists, and the state of Texas. Because the Albuquerque District had had little time in 1953 to study all aspects of the Rio Chama watershed, not enough attention had been paid to the impact of flood flows on the many small irrigation ditches below the proposed site. The District believed that the channel would sustain releases of 4,000 cubic feet per second [cfs] during spring runoff season. That figure dictated storage capacity and time schedules for delivery of compact waters downstream. Upon completion of the dam, however, the Corps realized that the channel capacity was much less than anticipated, making releases of 1,500 cfs more common. To do otherwise would wash out the diversion structures downstream, and cause flooding below a $20 million flood control facility.

The City of Albuquerque seemed unconcerned with these consequences in the 1970s as it looked about for storage areas capable of retaining its bounty from the San Juan-Chama diversion project. El Vado and Heron dam further north on the Rio Chama were either too far from Albuquerque for easy delivery, or too small to hold the excess waters. For a time the District recommended Jemez Canyon Dam for the honors, despite legal restrictions that limited the facility to flood control and sedimentation only. The enlarged capacity of Jemez Reservoir would threaten the neighboring Santa Ana Pueblo, and Texas fought any changes in compact wording to increase the pool.

The Corps found itself in a quandary of major proportions when it agreed to store Albuquerque's water at Abiquiu Dam. The District Engineer informed city attorneys that they must acquire lands around Abiquiu for inundation by the extra storage, which meant approaching Hispanic landowners for purchase

of their holdings. Many local residents protested vigorously that the new pool would become a "playland for the rich," and leave the native people without their agricultural livelihood. The Abiquiu area had witnessed the radical movement of the 1960s led by Reies Lopez Tijerina, a Texas Protestant minister who sought to reclaim the lost land grants of Hispanic citizens via civil disobedience and litigation. Tijerina's famous "Courthouse Raid" of June 1967, in Tierra Amarilla, only served to heighten tensions over land usage in the Chama valley, and Albuquerque's move to condemn the area around the reservoir brought matters to a fever pitch.[18]

The relationship between the dam and its local opponents turned sour in 1976 when the District sought to implement the directives of a U.S. Senate resolution of 5 December 1975. Introduced by Senator Pete V. Domenici, former chairman of the Albuquerque City Commission, the document called on the Albuquerque District to revise its 1949 report on the Rio Grande basin to suggest modifications in the usage of Corps water projects. Domenici's purpose was to alleviate the strain that future San Juan-Chama storage would cause on the requirements of the Rio Grande Compact. In addition, the Federal Water Project Recreation Act of 1965 called for cost-sharing among state and local interests to create recreational pools behind federal dams. This was something else prohibited in New Mexico by compact agreement. Finally, the increased storage at Abiquiu could offer enough capacity to generate hydroelectric power, and the District included this study at the request of an interested potential customer, the Public Service Company of New Mexico.[19]

Local response to this latest direction in policy for Abiquiu took several turns. James W. Hall, director of the Ghost Ranch Conference Center, operated by the United Presbyterian Church, considered the matter a "fait accompli." Hall believed that a larger pool would not increase the "tourist or dollar volume to mean much of anything to Espanola." Yet as the largest landowner along the Rio Chama at Abiquiu, the Ghost Ranch could benefit by trading acreage for future water rights from the San Juan-Chama storage. Hall feared overcommercialization if the pool did develop, but the economic health of the ranch came first in his estimation.[20]

When legal resistance to the proposed water storage became moot, some local residents resorted to threats of violence in the vain hope of frightening away District employees at the dam. On the evening of 9 June 1976, the project manager spotted four men whom he described as "acting in a suspicious manner" around the restrooms of the recreation area. A search of the facilities uncovered two sticks of dynamite placed in one of the latrines, with no detonators or fuses nearby. Aware of the radical sentiments in the area, the ranger suspected members of Tijerina's Alianza Federal de Mercedes of planting the explosives. A check of the license plate on the vehicle carrying the four men connected them to "a member of a militant and radical organization, whose leader [Tijerina] had been charged and convicted of numerous felony offenses." Although FBI officials and the Corps' Southwestern Division Military Police investigated the situation, they found no threat to life or property and no further incidents occurred.[21]

In 1982 the storage of San Juan-Chama water at Abiquiu received congressional authorization with passage of Senator Domenici's Senate Bill 620, permitting storage of up to 200,000 acre-feet of additional waters at Abiquiu Dam. The level of the reservoir rose steadily after that year, creating both opportunities and problems for the District. Recreational usage promised to increase, and de-

velopers looked at the site for construction of cabins and summer homes. The City of Albuquerque had a storage facility that could retain nearly all of its future San Juan-Chama waters, while the Chama valley had a new recreational site to attract visitors and improve the local economy. But the issues of channel capacity and Texas opposition did not disappear. Jesse Gilmer, the Texas commissioner for the Rio Grande Compact, admired the engineering mastery of the Albuquerque District in its building of Abiquiu Dam. But he believed that the Corps had demonstrated little sympathy for the legal rights of his state, and that the District listened more carefully to the supplications of New Mexico water officials and politicians. As proof, Gilmer cited the change for Abiquiu in 1953, achieved without specific congressional legislation; similar amendments by Domenici to add the San Juan-Chama waters in 1982; and the alleged "about-face" of New Mexico and the Corps in 1959 after agreeing to install the uncontrolled spillway gate.[22]

Completion of the first two stages of the Middle Rio Grande Project offered several lessons to the Albuquerque District, which possessed the engineering and design capability to construct massive flood control facilities under difficult physical circumstances. Jemez Canyon and Abiquiu Dams provided regulation of spring runoff from the streams of the Rio Grande basin, and also helped New Mexico to reduce the huge water debt it owed Texas prior to completion of these projects. The District stood ready to assume other missions in civil works to help meet the needs of a fast-growing population that demanded large volumes of water for domestic, industrial, and recreational uses.

At the same time, however, the District became entangled in the labyrinthine puzzle of New Mexico water law and custom, while striving to comprehend the political and cultural uniqueness of the areas in which it worked. At times the highly sophisticated practices of the District caused it to misunderstand the customs and traditions of local residents of northern New Mexico. The District was trapped by the confusion of the pace of change washing over New Mexico in the decades after World War II. This created problems for the District's future even as it solved other questions of water resources development. The challenges of Abiquiu would reappear downstream in the 1960s at Cochiti Pueblo, where the accumulated experiences involving New Mexico politics, cultural diversity, and economic weakness would create the most controversial and perplexing civil works task ever undertaken by the Albuquerque District: the building of Cochiti Dam.

VIII

COCHITI AND GALISTEO DAMS

Of the many water projects designed and constructed by the Albuquerque District in its 50-year history, few presented a wider range of issues than the reservoirs and dams of Cochiti and Galisteo. Located some 50 miles north of the city of Albuquerque, Cochiti and Galisteo Dams were the last major elements of the multi-million dollar Middle Rio Grande Project. Even though Jemez Canyon and Abiquiu Dams held back hundreds of thousands of acre-feet of flood water and sediment, the lack of any storage facilities above the booming community of Albuquerque left that city unprotected. By the late 1950s the federal investment in Albuquerque had made it crucial to national defense and nuclear arms research. To insure continued government expenditures, an increasing standard of living, and safety for all homes and businesses that filled the flood plain, civic and political leaders approached the Albuquerque District in the mid-1950s to choose a suitable location for a large storage reservoir north of the city.

The original authorization of MRGP in 1948 could not have anticipated the factors at work ten years later that would trouble the work of the District. Evidence of this fact was Dennis Chavez's insistence on construction of Chiflo Dam, nearly 200 miles north of Albuquerque. The District concluded in 1948 that Chiflo and Chamita could manage the bulk of the floodwaters in the Rio Grande Basin, because Albuquerque's population at that date stood at slightly more than 60,000. But the combination of military installations, research centers, and postwar western expansionism forced the District to seek hurried amendments to the MRGP to avoid the disastrous floods of 1941 and 1942.

One reason that the Albuquerque District had not recommended storage facilities near Albuquerque was the joint-use study conducted by the Corps and the Bureau of Reclamation in the 1940s. At the time irrigation interests concentrated in the Rio Grande valley wielded the greatest economic and political clout, making Reclamation a logical choice as managers of water resource projects in the region. But the Bureau encountered problems that hindered its work in the valley in the 1950s, and which also ensnared the Albuquerque District when it undertook civil works construction in the basin. Central to these challenges was the presence of several Indian Pueblo communities along the banks of the Rio Grande. The Indians' use of the river dated to antiquity, and their resistance to rapid change led them to oppose plans harmful to their interests. Every year after World War II without a mainstem reservoir intensified the flood threat to Albuquerque, and also raised the levels of frustration at the positions taken by the Pueblos.

When the Albuquerque District took over the middle valley studies from Reclamation in the 1950s, a legacy of suspicion and doubt had formed in the minds of many Indian people in the villages from San Ildefonso to Isleta. The Corps represented the third major organization in less than three decades to

come to the native people seeking access to their lands. The problems of flooding harmed Indians and non-Indians alike, and each pueblo saw the merits of improved levees and diversion structures. The Rio Grande could carry over 40,000 cfs in the spring, according to District studies of the central reaches of the river, and in the summer flash floods had reached levels of 79,000 cfs. Although technical data did not exist prior to the early 1900s, a Spanish priest at Tomé, south of Albuquerque, had estimated a flood in 1828 that computed in modern terms to nearly 100,000 cfs. This quantity would have been enough flooding to cover modern downtown Albuquerque with 20 feet of water. But protection of the city necessitated a compromise that few Pueblo residents embraced: inundation of their best farmlands along the river, and the subsequent loss of their agricultural livelihood.[1]

So long as central New Mexico remained sparsely populated, the Pueblo lands on the Rio Grande did not entice government agencies seeking reservoir sites. Prior to World War II the Middle Rio Grande Conservancy District [MRGCD] established a floodway from Cochiti Pueblo north of Albuquerque to the mouth of the Rio Puerco below Socorro. In the 1930s the MRGCD attempted to construct levees and embankments to enlarge the flood corridor for Rio Grande waters. Yet the MRGCD knew that without a flood and silt retention dam, no amount of levees could hold back the Rio Grande indefinitely. The conservancy district tested several locations, and concluded that San Felipe Pueblo offered the "best site on the Rio Grande between the State Line and Elephant Butte Reservoir." This plan required the removal of the entire Santo Domingo Pueblo to higher ground, and condemnation of farmlands in both villages for a reservoir. Construction costs would have driven MRGCD into bankruptcy, and the legal battles would have stretched on for decades.[2]

While the conservancy district retreated from its mid-valley plans and built El Vado far to the north on the Rio Chama, the Bureau of Reclamation stepped in to revive the mainstem studies. The 1941 Rio Grande flood washed out levee sections at nine locations, silting over 8,000 acres of pasture and farmland near Albuquerque. Congressman Clinton Anderson called in Reclamation to evaluate the situation as part of the Flood Control Act of 1941. Within months the Bureau reported to Anderson that the San Felipe site showed promise, as did the Otowi crossing at San Ildefonso Pueblo. The Bureau then moved onto Pueblo lands to drill core samples for potential dam construction, and to survey bottom lands at the two pueblos for reservoir storage.

The governors of San Ildefonso and San Felipe supported the initial studies of the Bureau on the advice of the Bureau of Indian Affairs [BIA], out of a sense of wartime patriotism. Many young Indian men and women had enlisted in the military, while others left home to seek employment in the many defense industries and installations in the Southwest. Pueblo people saw more of the outside world in the 1940s, and Indian leaders felt a commitment to join the national sacrifice requested by President Roosevelt after the bombing of Pearl Harbor. But the goodwill extended by Pueblo officials turned sour when Reclamation surveyors showed little regard for tribal lands and religious sites. The people of San Ildefonso believed that the spring at Otowi was sacred, and disliked drilling equipment boring holes around it. Other Bureau transgressions included overturning a Pueblo shrine and leaving behind survey markers on San Ildefonso's holy ground at Black Mesa. When in March 1942 the various Pueblo governors confronted Reclamation officials and demanded cessation of the survey work, they were told: "The government has a strong law and it can con-

demn the village and the cultivated lands."[3]

When word of the standoff reached Representative Anderson, he took swift action in Congress to circumvent Indian opposition to the much-needed flood control surveys. Anderson introduced House Resolution 323, authorizing the Secretary of the Interior to permit "exploration, surveying, and drilling of proposed dam sites" on Pueblo lands by Reclamation "without the consent of the affected tribes" and without an appeal process for Indian redress. The *Albuquerque Journal,* a staunch supporter of Anderson's and his one-time employer in the 1920s, downplayed the significance of the bill. But residents of San Felipe and San Ildefonso took note of HR 323, and petitioned the Bureau of Indian Affairs and Interior to fight its passage.[4]

The outcry against Anderson's measure was immediate, both in New Mexico and nationwide. The *New York Times, San Francisco Chronicle,* and *Time* and *Life* magazines ran feature stories on the bill, while the American Civil Liberties Union and several Indian rights organizations threatened lawsuits all the way to the Supreme Court. At first Anderson stood firm, believing that Albuquerque's flood protection outweighed inconveniences to Pueblo communities. But the response jeopardized Anderson's other plans, most notably his Rio Grande Basin Authority that would underwrite Albuquerque's future growth. Moving to blunt the criticism, in March 1943 Anderson attached several amendments to HR 323, including time limits for surveying Pueblo lands and prohibition of drilling near kivas and other sacred places. When these failed to satisfy the Pueblos or their supporters, Anderson removed HR 323 from consideration. In its place was a $100,000 appropriation authorizing Reclamation to join the Corps in its larger MRGP studies, and to leave untouched any Indian lands in the valley.[5]

For all parties concerned, HR 323 had a profound impact on flood control in the Rio Grande basin. The Bureau of Reclamation receded from the competition in the valley, first losing Anderson's proposed RGBA in 1945, and then having to accept "channel rectification" as its part of the 1947 memorandum of understanding with the Corps. For the Albuquerque District, the 1943 authorization gave it primacy in matters concerning the Rio Grande basin. But with this came obstacles as well. Chiflo, Chamita and Jemez Canyon Dams were the best defense available to the city of Albuquerque without encroachment on Indian lands. When these proved inadequate without a mainstem project, the District became embroiled in controversy surpassing that of HR 323. As for the citizens of the Rio Grande Pueblos, they had temporarily escaped the inevitable: a major campaign by a state or federal flood-control agency to utilize their lands in the protection of downstream communities. Resentment and mistrust were understandable emotions in the minds of many Indian people. These attitudes would later complicate the selection of Cochiti Pueblo as the site for a large storage reservoir in the late 1950s.

The need for Cochiti Dam originated with several related incidents. Albuquerque sought protection not only for its downtown, but also for the levees built first by the MRGCD and later the Albuquerque District. Increased volumes of sediment, called "stream aggradation," threatened to wash out millions of dollars of improvements throughout the Rio Grande valley. The soaring costs of Chamita Dam had removed it from contention and left the Rio Chama below Abiquiu Dam to disgorge thousands of cubic yards of silt into the main channel of the river. Insurance companies in Albuquerque, one of which was the Clinton P. Anderson Agency, refused to underwrite expansion of businesses on the most

desired lands because these areas flirted with flood disaster annually. The state of New Mexico could not meet its obligations to Texas, partly through the droughts of the 1950s and the increase of evaporative vegetation in the San Marcial-Elephant Butte area. A large reservoir and dam upriver from the now-bustling city of 175,000 could alleviate all these problems, provide much-needed employment for construction workers and engineers, and prepare Albuquerque for a bright future.

Confronting this surge of interest in dam construction were the 150 families of the Pueblo of Cochiti. Located on the banks of the Rio Grande between Albuquerque and Santa Fe, the Pueblo had been inhabited almost continuously since the 12th century. The Cochiti people were related to a larger group of pre-Columbian, Keresan-speaking villages that resided in Frijoles Canyon, west of the present-day Cochiti Pueblo in what is now Bandelier National Monument. Spanish explorers of the 16th century who came among the Cochitis described them as "very peaceful," subsisting on irrigated crops and wild game hunted in the nearby Jemez Mountains. The Cochitis traveled among the river Pueblos to trade their agricultural surpluses, and would dig for turquoise in the Cerrillos hills to fashion ceremonial jewelry.[6]

The coming of the Americans and their government to the Southwest brought changes to Cochiti, as it did for all Indian communities. Even though the native people had governed themselves for centuries, the United States placed them under the purview of the Bureau of Indian Affairs, an agency whose primary mission was the "Americanization" of Indians throughout the West. The policies of the BIA were directed more towards the nomadic tribes of the Great Plains, whose adaptation to the sedentary life of the reservation would be more difficult than the agriculturally oriented Cochitis. But one fear shared by all tribes was the desire of the federal government to restrict their land base. This would provide attractive farming and grazing lands for westward-bound settlers. This policy affected the Cochitis in the late 19th century when "squatters," primarily Hispanic farmers and Anglo miners, moved onto their lands pursuant to the Supreme Court decision of *U.S. v. Joseph*. The Court held in 1876 that the Rio Grande Pueblos were a "superior brand" of Indians who did not require the same level of federal protection and expenditures as the nomadic tribes because the Pueblos had a more independent economic base in farming.

The *Joseph* case led to 40 years of encroachments upon Cochiti land. In the 1920s a future Indian Commissioner, John Collier, worked with several Indian rights organizations to stop the loss of Pueblo lands by defeating the Bursum bill of 1922. This attempt to quiet title to Pueblo community land grants led to formation of the Pueblo Lands Board in 1924. Ostensibly designed to repay each Indian Pueblo the fair market value of their lost holdings, the Board succumbed to pressures by non-Indian land claimants and offered to settle Cochiti and other Pueblo cases for 15 to 20 cents on the dollar. These actions made the Cochitis understandably concerned when other federal agencies came among then in the 1940s and 1950s seeking additional reductions in their land base to benefit growing metropolitan areas elsewhere in the valley.[7]

In 1956 the Chief of Engineers received notice from Congress that the 1948 report on the Rio Grande basin had become inadequate and required substantial revisions. The Albuquerque District began surveying the Rio Grande valley north of the city and found sites favorable to construction of a dam on land owned by Cochiti Pueblo. The District also recognized the need for a smaller fa-

cility several miles south of Cochiti, where Galisteo Creek flows into the Rio Grande. Both sites would protect Albuquerque from flood and sedimentation far better than Chamita or Chiflo dams, but would require acquisition of land from Cochiti and Santo Domingo Pueblos. Memories of the Pueblo Lands Board and HR 323 lingered in the minds of tribal leaders of both communities. Their resistance would make construction of the two storage reservoirs more difficult than the District first imagined.[8]

When the Albuquerque District concluded its preliminary studies of Cochiti and Galisteo Dams in December 1958, it solicited commentaries from several federal agencies with land and water interests in the area. Some supported the idea of two reservoirs, while others had their doubts. The National Park Service disliked the plans to flood part of White Rock Canyon on the west side of Cochiti Pueblo. This endangered a half-dozen Indian ruins located on some 500 acres of Bandelier National Monument. The Public Health Service [PHS] of the Department of Health, Education and Welfare warned the District that standing water at the Cochiti site created an excellent breeding ground for mosquitoes, and threatened the lower reaches of the valley with diseases like encephalitis. The PHS wanted water levels kept low and spraying done constantly in the spring to kill any nesting areas, Paradoxically the Federal Power Commission hoped that Cochiti would not be limited to flood control alone, since a large pool could generate annually 70 million kilowatt-hours of electricity for sale to Albuquerque and Santa Fe.[9]

The response of the Albuquerque District to the concerns of the above federal entities corresponded with the need for rapid development. The District promised to maintain the low-lying areas to avoid mosquito infestation and reminded the Federal Power Commission that plans called for flood storage only at Cochiti, making hydropower inadvisable. Of more concern was the Park Service charge that archeological sites stood in danger from storage in White Rock Canyon. The late 1950s was not marked by national interest in environmental questions, even though in 1956 the Sierra Club and other groups had successfully thwarted Bureau of Reclamation plans for a high dam in Echo Park Canyon of Dinosaur National Monument. The District concurred in the judgement of the New Mexico state engineer, who believed that the flooding of White Rock Canyon was "negligible . . . when weighed against the grave flood dangers to the middle Rio Grande valley [including presently occupied Indian pueblos]." The loss of six archeological sites did not diminish the larger total of "hundreds of individual Indian ruins" in Bandelier National Monument. The state thus concluded that the Park Service objection "was not valid."[10]

The basic agreement of the federal agencies involved did not extend to the Cochiti and Santa Domingo Pueblos. The locations chosen in 1958 meant inundation of the best grazing and farm land of both communities, and over 300 archeological sites. Thus neither Pueblo would resolve the title question without a fight. To mitigate this situation the District entered into long, laborious and at times bitter negotiations with the Gallup Area Office of the BIA and the respective tribal councils. Several factors on both sides worked against an amicable and early settlement. The councils harbored no love for federal agencies wanting Indian lands. The majority of Cochiti and Santo Domingo adults were more conversant in Spanish and Keres than in English. The Indians did not fully understand the pace of change occurring in Albuquerque that required such projects as huge reservoirs above town. When negotiators for the Corps told the Cochiti council that 3,500 acres of their 22,000-acre pueblo were

needed, the council's hesitance to discuss the matter made sense to community members. Those factions opposing the dam had great popularity at Cochiti and Santo Domingo.

The obstacles hindering the Albuquerque District were no less severe than those facing the Pueblos themselves. The District had attempted in its 1948 report on the Rio Grande basin to avoid contact with Indian lands at all costs. But the regional growth fueled by Clinton Anderson's efforts on the Atomic Energy Committee and the National Aeronautic Space Committee, and Dennis Chavez's chairmanship of the Public Works Committee, placed a heavy burden on the staff of the District. Anderson, Chavez, and proponents of New Mexico's economic prosperity were more concerned about six feet of floodwater in downtown Albuquerque than loss of Cochiti farmland. When tribal council members questioned the need for such a hasty decision, Corps representatives cited reasons of national sacrifice and the greater public good. Having heard similar pleas in years past, the Cochiti council moved gradually toward its answer.[11]

As the pace of negotiations slowed, growing frustration on the part of both sides threatened any rational judgement. The District suffered from conflicting signals given by its personnel toward tribal officials, especially at Cochiti where the stakes were highest. Some employees of the District earned the confidence of the Pueblo people, especially the religious leaders, and promised protection of sacred shrines and holy places during the period of construction. This cultivation of tribal goodwill would help the District smooth over some of the points of contention between the Corps and Cochiti residents, leading District officials to believe that a solution might be near.[12]

Unfortunately, not all encounters between Cochiti leaders and District personnel worked out as cordially. Most District representatives were not native to New Mexico, and had not worked with Indians in their previous assignments. Added to this was the official government Indian policy of the 1950s known as "termination." In House Resolution 108, passed by Congress in 1953, the BIA had orders to categorize every tribe of Indians under its jurisdiction as to their readiness for self-sufficiency and release from federal control. This attitude stemmed from the well-intentioned philosophy of the Eisenhower administration to reduce federal expenditures in all departments. Many observers of Indian affairs believed that the only route to equality for native people lay in forced separation from the paternalistic embrace of federal monies. For some tribes this proved no obstacle, as their resource base and number of acculturated citizens gave them a foundation upon which to survive. But for others, including the Cochitis, the turnabout from dependency on BIA money and authority required time and patience. These two qualities, however, were not readily available to the planners of the Albuquerque District.[13]

The Corps of Engineers did not face alone the question of Indian land tenure at Cochiti and Santo Domingo. In the 1950s the Missouri River Division [MRD] of the Corps had plans for construction of no less than 107 reservoirs, dams, jetties, and flood levees along the Upper Missouri and its tributaries on the Northern Plains. Working under pressures similar to those confronting the Albuquerque District, MRD entered into discussions with the bands of Lakota people, or Sioux as they are commonly known, leading to what one historian described as disastrous results for the Indians. By means of promises of other lands, lures of employment, cheap electricity, and threats of condemnation proceedings, MRD convinced the Missouri River Sioux to accept the need for sacrifice to preserve the economic vitality of the entire Missouri basin. The tenor

of the times, however, led few individuals to criticize the process of negotiations. The success of the MRD with the Plains tribes led officials of the Albuquerque District and OCE to recommend "enabling legislation" to condemn Cochiti land if the tribal council was not more cooperative.[14]

The issue of Cochiti deliberation reached its peak in April 1959, when Alfred Herrera, governor of the Pueblo, asked the Board of Engineers for Rivers and Harbors to reconsider its site for the dam. Herrera was a crucial figure in the discussions, as he called for moderation when the tribal council faced deep divisions on the matter. The Pueblo knew that flood protection would benefit many individuals, including the Cochiti people. Herrera also accepted the reality of a dam on Cochiti land, since District personnel informed him that this was the best place to anchor a large storage facility without harming the more heavily populated stretches of the river. But the tribal religious leaders considered the dam a threat to lands used in ceremonies or as shrines. Herrera called upon the Corps to move the dam upstream and spare what the governor termed "an area [that] cannot be expressed in monetary terms."[15]

The Pueblo did not consider this request extraordinary, given the impact the dam would have on their land base and lifestyle. Fifteen percent of the best Cochiti acreage would be flooded, with no compensatory employment or federal annuities to restore economic vitality to the community. The council had hoped to enlarge its landholdings by asking the Indian Claims Commission to return the La Bajada Land Grant east of Cochiti. Governor Herrera received word of dismissal of the Pueblo's case just as the Albuquerque District began discussing condemnation proceedings. As tactfully as he could, the governor asked the Corps to give "serious consideration" to the change of damsite, a circumstance that Herrera described as "distasteful to our Pueblo."[16]

The Cochiti objections and the District's position could not be resolved legally, and the dilemma became part of the official report filed by the Corps with the Senate Public Works Committee in 1960. The District had completed the necessary engineering and geologic studies, but could not include any documents pertaining to the lease, purchase, or easement onto lands needed for construction work. The report detailed at length the positions of Cochiti and Santo Domingo, which revealed the Indians' awareness of the need for Cochiti and Galisteo Dams, as well as their strong bargaining stances with the District.

Of the two facilities described in the 1960 report, the more important was Cochiti Dam and Reservoir. The Cochiti tribal council urged removal of the site one mile north, to avoid inundation of lands which the District considered as having only "esoteric value." Should the Congress not agree to this request, Cochiti asked for the following in compensation: a trade of tribal lands for federal, state or private tracts of equal or greater value; retention of all water rights to any lands sold to the Corps, despite New Mexico water law to the contrary; and the right to construct and operate recreational facilities and collect user fees as the Cochiti council saw fit. The Santo Domingo people asked for similar guarantees at the proposed Galisteo Dam, with two notable exceptions. The Santa Fe Railway had received several sections of Pueblo land for their roadbed in the 1880s without the consent of the Santo Domingo people. The Pueblo sought relocation of the train tracks away from their village and restoration of the lands to tribal ownership. Santo Domingo then asked that Congress agree in writing to indemnification should Galisteo Dam fail to hold water.[17]

The position of the Indian Pueblos took on a new twist when the United States Forest Service learned of their demands. This division of the Department

of Agriculture controlled some 3,200 acres of the lands targeted for inclusion in Cochiti Reservoir. The Forest Service also managed 700 acres as part of a Land Utilities Project within the confines of the planned Galisteo Dam. Field offices of the Forest Service had not been contacted by the Albuquerque District, contended E. L. Peterson, assistant secretary of Agriculture, nor were they given the opportunity to explore the land exchange sought by the Pueblos and the District.

Besides the bruised ego of the Agriculture Department, Peterson saw a larger principle at stake. In 1959 the House Committee on Government Operations had debated the practice of land transactions for federal water projects, and concluded that such exchanges as Cochiti requested would "impair the National interest in sound resource conservation and management." The Forest Service believed only in cash payments or condemnation hearings. To do otherwise, said Peterson, "would place the Indians of the Cochiti and Santo Domingo Pueblos in a privileged and preferred position in relation to other property owners whose lands are acquired or taken by the Federal Government." National highway and military construction projects would fall under the same category, harming the land base of the government while supporting a fortunate few at the taxpayers' expense. Peterson recommended the sale of the "Caja del Rio-La Bajada" grant to the Cochitis; an area described as "submarginal and depleted" that was not attractive to local non-Indian ranchers. If the Cochitis rejected the arrangement, they could take their money like anyone else and purchase other lands that they found appropriate.[18]

The question of acquiring easements onto Cochiti and Santo Domingo lands grew more complicated with pressure from New Mexico state and local interests to establish a permanent pool behind the proposed Cochiti Dam. Three factors drove pool supporters to amend the Albuquerque District's 1958 interim report on the project. The increasing population of the central Rio Grande valley was more urban than the citizenry prior to World War II. These individuals enjoyed weekend recreation outdoors, and the year-round mild climate offered city-dwellers escape from the more-congested conditions of Albuquerque and environs. In this regard the newcomers were no different from other eastern and northern expatriates who fueled the postwar population boom of the Southwest. When many of these people found no large bodies of water in their semi-arid region, they demanded quick solutions of their leaders, and the dam at Cochiti Pueblo looked inviting.[19]

Of more immediate concern to proponents of a storage reservoir at Cochiti was the impending construction of the San Juan-Chama diversion project. By the late 1950s the Bureau of Reclamation had completed most of its preliminary studies, and had approached municipalities and irrigation companies in New Mexico in search of clients for the delivery of west slope waters. The major purchaser was the city of Albuquerque, whose planners agreed with Clinton Anderson that future growth would draw down wells in the Albuquerque reaches of the Rio Grande basin. This threatened not only the economy of Anderson's hometown but New Mexico's supply of compact waters for Texas. The city therefore agreed to a graduated schedule of purchases from the Bureau that increased Albuquerque's water supply by 400,000 acre-feet in the year 2000. Because all parties knew that Albuquerque could not utilize the water for several decades, and because New Mexico water law required "beneficial use" of streamflows under threat of removal of rights, the San Juan-Chama allocations had to be stored somewhere. If Cochiti could take a portion, and Abiquiu Dam

and El Vado could also take a share, all sides would benefit and New Mexico would not lose its waters to Arizona or California, as many feared would happen.[20]

The water-sports enthusiasts, the city of Albuquerque, and the Army Engineers, all of whom supported a permanent pool at Cochiti, encountered obstacles even before Congress could study the proposed authorizing legislation. The Rio Grande Compact stipulation that delayed agreement on Abiquiu Dam in the 1950s was again resurrected by Louis A. Scott, compact commissioner for Texas. Scott saw problems of water delivery from Cochiti identical to those facing Abiquiu. New Mexico stood several hundred thousand acre-feet in debt to Texas, and no storage facilities could trap flood waters for any pools so long as the debit situation existed.

On 30 July 1958, Scott informed Colonel Albert Reed, Albuquerque District Engineer, that his state would support both Galisteo and Cochiti Dams only if they included no provisions for permanent storage. Scott and Reed had discussed an elaborate reservoir regulation plan for Cochiti wherein Texas asked that the Corps guarantee certain volumes of water to be released at flood time, the irrigation season, and the late summer low-flow periods. When the District plan came out in September 1958 with more vaguely worded terms than Texas liked, the state registered its official disapproval at a meeting of the Corps and compact members in El Paso.[21]

By this time the Texas position on storage waters at new facilities in New Mexico was well-known to public officials and District employees. The latest round of negotiations convinced the New Mexico state engineer and other interested parties that San Juan-Chama waters offered the best solution to the permanent-pool controversy. The Albuquerque District informed New Mexico state officials in December 1958 that the Corps needed statistics on water rights for its pending report to Congress. The District wanted no part of the argument among the compact states, even though it looked favorably upon increasing the size of Cochiti reservoir.[22]

The urgency of the District's deadline prompted the pool advocates to formulate a plan for Cochiti within weeks. The New Mexico coalition of water agencies found that it was its own worst enemy on the Cochiti matter, because the memorandum of agreement with the Bureau of Reclamation for San Juan-Chama waters stipulated usage only for municipal and agricultural concerns. One solution appeared to be the purchase by the state of some San Juan-Chama water for the pool, with payment to the Albuquerque District for storage and expansion of Cochiti reservoir. New Mexico interests would then require $5.3 million for creation of a 50,000 acre-foot pool covering 1,200 surface acres. In addition, 5,000 acre-feet would be needed each year to compensate for evaporation losses. Given the heavy debt facing the Middle Rio Grande Conservancy District, and the need for the city of Albuquerque to pay for storage of its water at the rate of $24.50 per thousand acre-feet, the potential for a locally funded recreational facility appeared remote.[23]

The sobering financial details of the Cochiti pool triggered a series of policy changes that reached from the city of Albuquerque all the way to Congress. These changes also paved the way for the commencement of the last major phase of the Middle Rio Grande Project at Cochiti and Galisteo Dams. New Mexico state officials approached the Albuquerque City Commission with a plan to use the city's San Juan-Chama waters in a pool at Cochiti, while asking the federal government to underwrite the cost of delivery and storage. The New

Mexico Department of Game and Fish reminded the city of the Jemez Canyon Dam fiasco in 1958, and of the economic benefits accruing to Albuquerque with a permanent water recreation area nearby. No longer would Albuquerqueans have to drive 400 miles roundtrip to Conchas or Elephant Butte reservoirs for sailing, water-skiing, and other outdoor recreation.

For his part, state engineer Steve Reynolds advised New Mexico Governor John Burroughs to alter the state's petition on uses of the San Juan-Chama waters to permit storage at Cochiti. The state would share in Albuquerque's bounty, said Reynolds, since New Mexico state highway department statistics revealed a total of 12,163 people driving through Albuquerque in out-of-state vehicles every day in 1958. If that source of patronage for a lake at Cochiti could be tapped, state revenues for fishing and boating licenses would increase, as would gross-receipts taxes on items connected to water sports and tourist activities.[24]

The most critical facet of the New Mexico plan for Cochiti storage remained federal support of its costs, initially and in subsequent years. To accomplish this the state called upon its most powerful figure in Washington, Senator Clinton Anderson. State engineer Reynolds went to the nation's capital on 30 September 1959, to discuss strategy for the Cochiti proposal. He informed Anderson of the public interest in the pool, the agreement of the city to store 57,000 acre-feet of water there, and the loss of same to Arizona and California without proper utilization of the resource. Reynolds also had a copy of a letter from Alfred Herrera of Cochiti backing establishment of the reservoir. The tribal council had learned of the potential for fishing revenues at such a facility, and those who favored construction hoped to share in the estimated $600,000 paid annually by fisherman who would make a total of 150,000 individual visits.[25]

Given this overwhelming testimony on behalf of the Cochiti project, Anderson and Reynolds collaborated on methods of gaining Congressional approval. The federal government had not considered recreational use as a legitimate water project "benefit" equivalent to those supplied by navigation, flood and sediment control, irrigation, or hydroelectric power. The phenomenon of outdoor water sports had yet to sweep the nation, and those interests petitioning Congress in the 1950s for federal funding of reservoirs and dams represented agricultural, municipal, and industrial clienteles. The nation's lawmakers had taken a step in that direction with passage on 12 August 1958 of Public Law 85-624. This allowed the U.S. Fish and Wildlife Service to integrate hunting and fishing into future federally operated water projects, but the law contained no mention of water sports or other recreational uses.

The conclusion reached by Anderson and Reynolds reflected the multitude of conflicting pressures on construction of Corps water projects in the late 1950s. If President Eisenhower's Bureau of the Budget would declare an uncontrolled spillway gate at Abiquiu Dam as an unnecessary expense, despite the Rio Grande Compact's opinion to the contrary, it would certainly find a pool at Cochiti frivolous. Yet the state and local interests saw great potential from the dam, in spite of eastern criticism of federal expenditures to underwrite Southwestern growth. As a veteran of two decades in Washington, Anderson knew of certain parliamentary maneuvers that the Corps might use to achieve the pool. Reynolds recalled Anderson's advice that "provisions for [a] permanent pool should be made as subtly as possible to avoid opposition in Congress." These measures included delaying mention of the pool until after Congress authorized the project, and then attachment of the pool to non-related bills already on the

Senate calendar. In either event the state should move forward on its request, since the economic necessity dictated quick resolution.[26]

The novelty of complete federal payment for water recreation at western reservoirs stymied efforts by Anderson and Dennis Chavez, even though each held prominent committee positions in the U.S. Senate. Certain members of Congress wondered why the Rio Grande basin needed any more flood protection after the authorization of levees, and Jemez Canyon and Abiquiu Dams. A Mr. Jennings of OCE testified before the House Public Works subcommittee in 1957 on the overall MRGP and its unmet needs. One congressman questioned why this work required so much money to protect a relatively sparse population located along a river that many believed had plenty of flood protection. "Is there a history of floods there?" said Representative Edward Boland. "I thought this was the river Will Rogers suggested they pave." Jennings assured Boland that increased flood protection would not waste the taxpayers' money, and requested $11 million for channel improvements in the Albuquerque area.[27]

When the budget hearings for 1961 opened, Anderson attempted to change public perceptions about the Rio Grande basin and its recreational potential. Time did not permit him to convince enough senators of his position, so that the authorization contained in Public Law 86-645 [the Flood Control Act of 1960] made no mention of storage waters at Cochiti. The legislation did call for a large structure at mile 340 of the Rio Grande on Cochiti Pueblo land, made of earthfill standing 260 feet high and reaching 5.6 miles across the valley at the dam's widest point. Such a facility could retain 597,000 acre-feet of water, divided between 492,000 acre-feet for flood storage and 105,000 acre-feet for sediment control. The spillway on the east side would empty into the nearby Santa Fe River, which then conveyed the overflow into the Rio Grande one mile south of the dam. The costs were as impressive as the scale of the project. Between land acquisition, damage claims, and construction estimates, the Albuquerque District sought $48.4 million for Cochiti Dam and Reservoir.[28]

Of added significance to the District in the 1960 legislation was authorization of Cochiti's companion project, Galisteo Dam and Reservoir. Galisteo Creek drains a large area north of the Ortiz Mountains and southeast of Santa Fe to its confluence with the Rio Grande, some five miles below the then-proposed Cochiti site. Although the Galisteo only runs intermittently, like other tributaries of the Rio Grande it carries heavy concentrations of silt. The Pan American Highway, or U.S. Highway 85, crosses Galisteo Creek between Albuquerque and Santa Fe, where at that time, spring flooding often closed the road or wiped out the low-lying bridge. It was not uncommon to hear stories of cars swept away at night when they reached the dip in the highway during flash floods, or to have vehicles plow into huge deposits of sediment that overran the bridge abutments.

The 1960 Flood Control Act directed the Army Engineers to construct Galisteo Dam four miles upstream from the Rio Grande near the old railroad stop and mining center of Domingo. The dam would be 2.2 miles long and 150 feet in elevation from the streambed. It could retain up to 130,000 acre-feet of water, ten percent of which would be reserved for sedimentation. Among Galisteo's other features were a two-mile long channel to carry Santa Fe River drainage away from Cochiti Dam, the relocation of nearly ten miles of Santa Fe Railway trackage to higher ground, and movement of county roads and private power lines. The budget estimate for Galisteo anticipated high costs to reimburse Santo Domingo Pueblo for its lands, in excess of $4.3 million. This comprised

nearly one-quarter of the entire $16.7 million project estimate, whereas similar expenditures for Cochiti lands amounted to less than one and one-half percent of its total costs.[29]

Public announcement of the authorizations on 14 July 1960 met with mixed reactions. New Mexico water officials breathed a sigh of relief that Congress had appropriated start-up funds to complement the Flood Control Act. But omission of the recreational pool did not escape the eye of Tony Hillerman, editor of the *Santa Fe New Mexican*. His diatribes against similar circumstances at Abiquiu in 1959 had rankled Albuquerque District officials. Hillerman told readers of his column to "prepare for a shock." Cochiti Dam served as yet another "immense monument to federal bureaucratic blindness," as well as "another sacrifice on the altar of downstream irrigation interests." Having little knowledge of the feverish pace of activity surrounding Cochiti since the mid-1950s, Hillerman could only comment upon the information contained in Public Law 86-645. He concluded that "New Mexico's congressional delegation [had] given only lip service" to the concept of a permanent pool, and that Anderson, Chavez, and others stood in fear of the power of the Texas water interests. This latter group included irrigators in the southern part of New Mexico who "traditionally begrudge every drop of water stopped short of Elephant Butte Reservoir."[30]

The strain of the pool controversy on New Mexico's public officials left them sensitive to editorials like those in the *New Mexican*. State engineer Steve Reynolds composed a lengthy letter to Hillerman, calling his "pessimism" unfounded and his criticism of the Albuquerque District and New Mexico politicians "without justification." Reynolds, a party to the intricate planning and negotiations, told the editor that not only had the Albuquerque District supported a recreational facility at Cochiti, it had said as much in its report to Congress. At issue was acquisition of storage waters unencumbered by the Rio Grande Compact. Reynolds also informed Hillerman that the New Mexico congressional delegation had engaged in discussions to purchase large quantities of San Juan-Chama waters, for which the state engineer expressed his gratitude.[31]

Joining Reynolds in his rebuttal to the *New Mexican* was Clinton Anderson. The Santa Fe paper carried two more editorials on Cochiti after receipt of Reynolds' letter, both as harsh as the 26 July statement. Anderson ordered one of his staff members to prepare a response to Hillerman's repeated charges. The senator told the editor that they each argued for the same goal. "Throughout my service on the Senate Interior Committee," said Anderson, "I have tried to enhance and protect the recreation values offered by federally constructed reservoirs." As a member of the Senate Select Committee on National Water Resources, Anderson fought to educate eastern congressmen on the merits of recreation at western water projects. "I believe the day is not too distant," he prophesied, "when recreation will be recognized as one of the justifications for expenditure of federal monies for dams." Anderson, Senator James Murray, a Democrat of Montana, and other western politicians saw the uphill fight in which they had engaged. "Essentially what some of us have been asking," he confided to Hillerman, "is a change in Federal water policy." Charges like those leveled by the *New Mexican* offered no constructive viewpoints, but only served to divide northern and southern New Mexico, urbanites and irrigators, and sportsmen against the Corps' policies of flood protection.[32]

The storage situation took a major step towards resolution when Congress authorized construction of the San Juan-Chama project in 1967. Public Law 87-



Plate No. 31. Tribal Council of Cochiti Pueblo and District Employees

483 included permission for the Bureau of Reclamation and the city of Albuquerque to store 57,000 acre-feet of water behind Cochiti Dam. Steve Reynolds wrote to Stewart Udall, Secretary of the Interior, to expedite the project and to see whether Udall could declare the costs of the water a federal responsibility. Reynolds reminded Udall that the Albuquerque District needed verification of water rights for Cochiti before commencement of work at the dam. "This present instance," the state engineer concluded, "is an excellent example where water resources development and outdoor recreation can go hand in hand." Interior could thus join with the Corps to advance the quality of life in New Mexico, which Reynolds believed was the best use of the taxpayers' money.[33]

Despite Secretary Udall's desire for cooperation in the middle Rio Grande valley, he could not authorize free transfer of San Juan-Chama waters without congressional support. At the same time his department faced a change of attitude by the Pueblos of Cochiti and Santo Domingo over construction on their lands. The Cochiti tribal council complained that the Albuquerque District had not consulted them on the latest developments in reservoir utilization. The District cited numerous meetings with the council on the subject, including Alfred Herrera's interest in the recreational potential at Cochiti Dam. Santo Domingo Pueblo also voiced second thoughts on the plan to flood 4,000 acres of their land for Galisteo Dam. Trapped between Indian opposition and the spectre of flooding downstream, the District reevaluated its plans yet again in 1963 and concluded that there could be room for compromise.[34]

The most disturbing issue in the original plans was the location of Galisteo Dam. After surveying other sites on Galisteo Creek, the Albuquerque District found a suitable area on private and federal lands some 12 miles upstream from Santo Domingo Pueblo near the town of Waldo. The size of the project had diminished because Galisteo could no longer hold waters diverted from the Santa Fe River. Flood storage declined to 89,000 acre-feet behind a 157 foot-high earthen embankment. The cost remained similar to the original $16.7 million request of 1960. This revision eliminated the flooding of Santo Domingo lands, while still protecting the Rio Grande basin below Cochiti from heavy deposition of silt and flash flood lows.

The changes at Galisteo Dam also meant new specifications for Cochiti Dam. Pueblo concerns over protection of religious sites led the District to move the dam slightly north, causing the runoff from the Santa Fe River to be trapped behind an altered 5.3-mile-long earthfill structure some 251 feet in height. Because no agreement had been reached on storage, the District recommended an uncontrolled spillway that limited reservoir capacity to 602,000 acre-feet for flood and sediment control. These new plans increased the costs of Cochiti to $48.4 million and put the total for both projects in excess of $65 million.[35]

While the Albuquerque District offered its revised plans as proof of its sincerity with the people of Cochiti and Santo Domingo Pueblos, the tribal council of Cochiti considered the proposal insufficient to protect the Pueblo's interests. The council presented a counter-offer to the District on 17 March 1963, authorizing easements onto its lands for construction and maintenance of the facility. In exchange the District would have to offer to the Pueblo lands of equal value for those inundated, or pay for them in cash. Then in a move to strengthen the tribal economy, the Cochiti council adopted a resolution stating: "That to the extent possible and within the manpower and experience available, the Corps and its contractors will give preference to the Pueblo members in em-

ployment made available by the construction, operation and maintenance of Cochiti Dam and Reservoir."[36]

The Cochiti council believed that it had granted its approval in principle to building the dam with the 17 March resolutions. But final agreement ran afoul of Corps policies on post-authorization land surveys. The Albuquerque District informed the New Mexico state engineer that the additional survey work requested by the Pueblo to protect its grazing lands could not begin until after Congress appropriated construction funds. Elmer B. Staats, deputy director of Lyndon Johnson's Bureau of the Budget, considered this impasse to be grounds for rejection of Cochiti Dam monies in the 1965 budget. Staats found it interesting that the Budget bureau's letter of 18 April 1960 had informed the District that no funds would be forthcoming for that year until land arrangements had been made with Cochiti Pueblo. Congress had made no stipulation to that effect, but Staats feared legal suits if construction began prior to an official settlement.[37]

The deletion of Cochiti start-up funds caught all New Mexico public officials by surprise. Clinton Anderson had sponsored Senate Bill 614, allocating 50,000 acre-feet of San Juan-Chama water to Cochiti at complete federal expense. U.S. Representative Joseph M. Montoya of New Mexico offered similar legislation in the House. The District had targeted Cochiti for a $2 million appropriation, and had drawn up solicitations for prospective contractors. New Mexico's congressional delegation banded together and convinced their colleagues to award the Albuquerque District with partial funding for Cochiti, pursuant to an early resolution of land transfers. The District received $1.2 million for its 1965 work, allowing it to complete the design and planning phases of Cochiti, and to commence work on the access road and operations building at the site. The District took pride in its successful design of an elaborate outlet works stilling basin that decreased the speed of released water at flood stages. This would protect downstream farmers from flooding of their lands, and it would also keep waters within the 30-year old levees constructed by the Middle Rio Grande Conservancy District.[38]

In the summer of 1964 the threatened loss of project funds brought all parties to the brink of confrontation. Clinton Anderson and Joseph Montoya secured passage of Public Law 88-293, modifying the authorization of Cochiti Dam to "provide for conservation and development of fish and wildlife resources and for recreation." The federal government broke precedent in its management of western water projects by supplying at no cost to local interests 50,000 acre-feet to create a 1,200 surface-acre pool at Cochiti. This triumph meant little, however, without permission from Cochiti Pueblo to build the facility in which to store the free water.[39]

The stalemate over Cochiti finally broke late in 1964 with the intervention of Interior Secretary Udall. He encouraged the United Pueblos Agency, local supervisors of Cochiti affairs, to push for Cochiti management of recreational facilities at the reservoir as their reimbursement for the loss of land. On 10 December 1964, the Cochiti council allowed the Albuquerque District easements onto tribal lands as a preliminary to a final agreement. The District and OCE had despaired of reaching such a compromise, and had asked their legal counsels to prepare condemnation proceedings against Cochiti Pueblo. Unnamed individuals identified in the District's annual report as "higher authorities" discouraged these drastic measures, since the mood of the nation in the mid-1960s had shifted in favor of Indian rights and sovereignty. What might have worked

with Cochiti in the termination years of the late 1950s had become untenable, necessitating talks and diplomacy instead.[40]

Once construction crews had the right to pass through Cochiti lands, the final solution followed shortly. For a time the Pueblo of Santo Domingo made known its disapproval of the Cochiti agreement, and later in 1972 would destroy sections of the access road that ran southwest from U.S. Highway 85 at the base of La Bajada to near the damsite. The road crossed Santo Domingo lands, and that community believed that its neighbors had succumbed to the pressures of the Albuquerque District and local politicians. But the Cochiti council ignored this and other incidents as it worked towards a settlement with the Albuquerque District.[41]

On 16 November 1965, the District and the Pueblo executed a Memorandum of Understanding to outline the duties and responsibilities of each party prior to full acceptance. In an unusual concession, the District promised to build within five years such recreational facilities as boat ramps, picnic and camping grounds, restrooms, overlook shelters, and sewage treatment and electricity for the site. The Corps would then grant operation of the recreation areas to Cochiti Pueblo. The District further promised to construct additional facilities according to a Master Plan agreed upon by the District, the Bureau of Indian Affairs, and the Cochiti tribal council. For their part Cochiti leaders agreed to enhance the site by 1970 through construction of a marina, "country store," gas station, and concession stand. Within five more years the Pueblo hoped to add a swimming pool, a "restaurant-motel-lodge complex," and a riding stable at Cochiti Reservoir. The Pueblo would charge admission and user fees to generate revenues, and would maintain all facilities in accordance with District and Corps regulations.[42]

Once Pueblo Governor Fernando Cordero affixed his signature to the document, the District moved rapidly to begin its work. The Pueblo and the District arranged for a formal ceremony to grant easements of 4,069 acres for construction, operation, and maintenance of the dam and reservoir. Cordero saw this as "the beginning of a new era in the development of recreation and flood control in the state of New Mexico." The Pueblo invited many dignitaries to the occasion, but especially wanted some remarks from the new junior senator from New Mexico, Joseph Montoya.[43]

When he stepped to the microphone on Sunday afternoon, 12 December 1965, Montoya felt moved by past events leading to this day, and by the bright future the ceremonies signified. A native of Pena Blanca, a predominantly Hispanic farming village south of Cochiti Pueblo, Montoya had risen from legislative aide to Dennis Chavez to New Mexico lieutenant governor, to U.S. Representative, and finally U. S. Senator during the Democratic landslide of 1964. In a sense Montoya had "come home" that day, because his family wielded great economic and political clout in the area. The people of Cochiti also looked up to him as a "local boy who made good," and who could decipher the mixed signals that emanated from the nation's capital, its lawmakers, and agencies like the Albuquerque District.[44]

The elaborate negotiations over Cochiti Dam made Montoya's words both haunting and prophetic, and revealed the importance that the project had for the Albuquerque District, the Pueblo, and the Rio Grande basin. "Today marks the end and the beginning," the senator intoned, "of a long road for all of us." Montoya recalled the first feasibility study begun in March 1953, the authorization of 1960, the debate over the permanent pool, and the latest difficulties over

construction funding. "It is sad but true," he reminded his listeners, "that there are a great many worthwhile projects around this great country of ours . . . [that] are nothing more than lines on drafting paper because no money has ever been appropriated." Cochiti Dam threatened to fall into that category, but $4 million worth of "starter" money, as Montoya called it, had rescued the project and made its rejection by Congress all the more difficult.[45]

Montoya then turned to the most vexing question of all: the inundation of Cochiti lands. "You, Governor Cordero, and your people," the senator acknowledged, "understandably did not want to surrender your historic rights to your property." The Albuquerque District, on the other hand, "did not want to change the historic policy of requiring outright ownership of the lands on which it builds a dam." The senator commended the "statesmanship on both sides" that had achieved compromise and made construction a reality. Montoya then turned to the facility itself, labeling it as one of "the engineering wonders of the world." Cochiti Dam's 53 million cubic yards of earthfill would make it the "twelfth largest dam in the world, right behind the famous Aswan High Dam of Egypt." The payroll at Cochiti Dam would also seem gargantuan in regional terms, because over 1,000 workers would be hired, injecting $500,000 per month into the local economy. Cochiti Pueblo would also benefit from the visitation-days of fisherman and boating enthusiasts. Montoya had seen U.S. Fish and Wildlife statistics that showed sportsmen leaving over one-half million dollars annually with the Pueblo, a figure that he assumed was "only the beginning." The senator hoped that all obstacles had been overcome at the already-complicated site. "Now all we have to do," Montoya concluded, "is build the dam."[46]

The Albuquerque District took Montoya at his word, commencing operations on the dam, spillway, and reservoir with a 1967 appropriation of $2.7 million. Galisteo Dam did not face the hurdles of its neighbor to the west, and thus moved along much more quickly. By the end of 1967 Galisteo was 43 percent complete, while Cochiti stood at only 13 percent of construction. Galisteo Dam had also decreased some $3 million in estimated costs to $13.8 million. This was welcome news to the New Mexico congressional delegation, who found that costs at the redesigned Cochiti site had ballooned in the late 1960s. The $43 million projection made in 1960 had become $63 million by 1969, and two years later leaped further to $85 million. Joseph Montoya's optimism in 1965 rang hollow as new circumstances nationwide again threatened the unlucky Cochiti project.[47]

The involvement of the United States in the conflict in Vietnam had already affected the Albuquerque District in 1970 with its loss of military construction. As the undeclared war lengthened and public support began to wane, Congress and the executive branch realized that Lyndon Johnson's promises of "guns and butter" in the heady days of the mid-1960s required more of a financial burden than the nation cared to endorse. The rate of inflation started rising, and lawmakers scanned the federal budget for reductions to maintain the nation's war effort in southeast Asia. This led the Johnson administration to seek a ten percent surcharge on personal income taxes, a move that Congress would not accept without a corresponding $6 billion decrease in non-military spending. Johnson's budget planners believed that much of the money could come from eliminating many public works projects, and preliminary reports placed the expensive facility of Cochiti Dam on the list.[48]

The Albuquerque District averted disaster when Congress granted $5 million to continue work at Cochiti, and added $2 million more to complete Galis-

teo Dam. Galisteo's money enabled the District to place the dam in operation on 11 October 1970, with total storage capacity of 89,000 acre-feet of water. Cochiti, however, was only 30 percent finished by that time, due to the change in administrations and attitudes in Washington about federal expenditures on water projects. Richard Nixon looked at LBJ's budget and realized that he could not deliver on his campaign promises without incurring a large deficit. Nixon had inherited the philosophy of balanced budgets from his mentor, Dwight Eisenhower. His wish to reduce social program spending meant that agencies such as the Corps would have much more restricted funding than before.

In military construction this translated to the traumatic loss of assignments to the Fort Worth District. In civil works it suggested retrenchment of construction at Cochiti Dam. Nixon's Bureau of the Budget recommended slashing Cochiti's 1970 request from $3 million to $700,000, resulting in a one-year delay in completion. Carl H. Schwartz, Jr., of the Budget Bureau, informed Edward Jory, president of the Albuquerque Industrial Development Service, that Nixon "followed a policy of fiscal restraint" to correct the economic mistakes of the LBJ years. Unfortunately this meant "slowdown or delay [in] completion of a number of water resource projects." Schwartz could only hope that the situation was temporary, and that "budgetary action . . . taken this year will develop a better fiscal climate in following years."[49]

By now the Albuquerque District and New Mexico supporters of water projects had become inured to budget fluctuations, having experienced them in the early and late 1950s, and the denial of funds in the mid-1960s. The Cochiti situation, however, appeared more ominous than the previous lean years. Project completion stood at 22 percent in 1969, despite original predictions of conclusion by 1970. Albuquerque's population topped 250,000 and the expansion filled in an area along the Rio Grande where no appreciable advances in flood protection had been made. New Mexicans felt that Congress did not comprehend their need for assistance, since the overall spending limitations of the Nixon administration slashed the state's federal allocations by 45 percent. The national average, by comparison, hovered around 12 percent, with certain politically powerful states escaping the budget knife altogether. New Mexico made every effort to limit the damage at Cochiti, but the delays in construction only increased the tensions experienced by all groups dependent upon the project.[50]

The uncertainity of funding at Cochiti Dam affected more people than just the citizens of Albuquerque. In 1969 the District faced the possibility of losing both its military construction work and its most important water project. This caused great confusion and doubt within the ranks of District personnel, and also damaged the future capabilites of the staff. Several senior members of the construction divisions took early retirement to free their positions for younger employees, some of whom lost their jobs anyway. The reductions in force after 1970 thus weakened the staff numerically and in terms of experienced supervisory personnel. All this occurred at a time when the bulk of the large water projects had either begun or been completed. The impact on the District was severe, and would not improve for over a decade.[51]

Another interested party affected by the budget reductions of 1970 and succeeding years was the primary contractor at Cochiti, the Guy V. Atkinson Company of South San Francisco, California. An accomplished builder of water projects in California and the Pacific Northwest, Atkinson faced cash-flow problems every year that it held contracts at Cochiti. Funds became available in 1971 to begin work on the earthfill dam, but the Nixon administration requested no

monies in its preliminary budget for 1972. Atkinson and the Albuquerque District needed $9 million to see them through that year, and for several months in the fall of 1971 the contractor relied upon its own resources to maintain the work schedule. What frightened Atkinson about the erratic funding cycle was the knowledge that 1973 called for a quantum leap in Cochiti expenditures to $26 million. The contractor bombarded the offices of the New Mexico congressional delegation with pleas for assistance, hoping that Congress might reconsider the severity of budget cuts in the Albuquerque District appropriations.[52]

The problems of funding at Cochiti led Atkinson and Company to rely upon its highly skilled labor force from California to save time and expenses. While this approach made sense from a business perspective, it dampened the expectations that local residents had for employment. In much the same fashion as with the District's first project at Conchas Dam, the Corps was called upon to alleviate severe unemployment in the Cochiti area. The work at the dam required experienced technicians and heavy equipment operators. The lesser tasks could be performed by New Mexicans from the surrounding area, but this number would not decrease significantly the 13 percent jobless rate at Cochiti.

The circumstances surrounding hiring practices at Cochiti Dam were affected by the unique local history that Atkinson understood only vaguely. The Cochiti council could pass resolutions demanding Indian preference in hiring because the damsite rested on their lands. Their Hispanic neighbors in Pena Blanca and Sile had no such clout, even though their financial status paralleled that of the Cochitis. Pena Blanca, however, could boast of the U.S. Senator who fought for construction of the dam, and who made impassioned pleas in the late 1960s for more government programs to aid underprivileged Hispanic communities. Joseph Montoya's constituents had heard the promise of 1,000 jobs and half-million dollar payrolls. They hoped that the work at Cochiti Dam would include them as well.[53]

Residents of Pena Blanca could not know of the pressures under which the Albuquerque District or its prime contractor labored to keep Cochiti Dam on schedule. What they could see was that the promises made by Senator Montoya to bring prosperity to his hometown did not materialize. Only one citizen of the Hispanic towns near the dam worked for Atkinson in 1971. The other major employer in the area, the Kaiser Gypsum Company, closed its mine at Rosario on 31 December 1970, laying off 60 men. Many families subsisted on food stamps and welfare checks in the shadow of the rising flood control facility. Members of the Pena Blanca "Emergency Committee on Employment" knew that the Montoya family profited from the sale of its gravel to the contractor, and demanded action from their most prominent citizen for their own hardships.[54]

The employment question touched a nerve with the Albuquerque District and with Atkinson and Company. Unlike the depression-era conditions at Conchas, the District had no mandate to employ people whom it believed "did not possess the required skills." Senator Montoya called upon Stanley Resor, Secretary of the Army, to locate funds for training of the New Mexico unemployed for jobs at the dam. Montoya told his constituents that help was forthcoming, even though he admitted, "Much of this is out of my control as a Senator." OCE informed him that the Army had no such funds, but that it would seek assistance from the Labor Department to establish training programs like those operated at Conchas Dam in the 1930s.[55]

The contractor at Cochiti took a slightly different view of the employment situation than did Montoya or the Corps. Atkinson believed that under the cir-

cumstances it should be praised for its outreach efforts. Training had been undertaken to prepare "minority groups" for equipment operation, maintenance, and other activities. Atkinson boasted of "thirty-one percent of total employment from the minority groupings." Joe B. McNabb, Senior Vice President for Atkinson, attributed the criticism to a "select half-dozen people" who engaged in "continuous showmanship behavior, whatever their motive may be." What McNabb failed to recognize was that his company's recruitment efforts targeted only the Pueblos of Cochiti and Santo Domingo. By ignoring the local Hispanic population Atkinson not only created animosity towards itself in Pena Blanca, it also summoned up the old bitterness between Indian and Hispanic residents over economic co-existence in the Rio Grande valley. Atkinson sensed that something was amiss, however, when it informed Montoya that, "We in our company are all working very hard to improve relationships within the local area, knowing fully that it is impossible to please everyone."[56]

As with other portions of the Middle Rio Grande Project, the debate surrounding Cochiti Dam lessened with the advance of construction. Cochiti became the single largest civil works project that the District would control, standing 251 feet high, 5.4 miles long, and containing over 60 million cubic yards of earthfill. With passage of Public Law 88-293, the District redrew its reservoir plans to incorporate the 50,000 acre-foot pool targeted for fishing and water sports. The District and the contractor experienced difficulty as the project reached closure of its gates in 1973, but none seemed so critical as the employment and land questions of earlier years. The contractor did face the threat of a work slowdown in 1974 when the Albuquerque District received word of new federal regulations on non-essential uses of energy supplies. The oil embargo of 1973 led the federal governnment to suggest reductions of unnecessary travel and work on government projects. While long lines at filling stations and gas rationing did not reach New Mexico, Atkinson worked out a plan with the District to meet any emergency. The winter of 1973-74 was the most important period for Cochiti, since anticipated spring floods could overrun the former access channel in the river and damage the entire structure when it was 82 percent complete. "That a fuel shortage," wrote Fred M. Butler, Atkinson's project manager, "would restore such a chance [of disaster] seems intolerable."[57]

On 12 November 1973, Colonel James Sutton, District Engineer, ordered closing of the Rio Grande to permit storage behind Cochiti Dam. This was the last major step toward complete operation of the facility. The event had great significance for the District, given the level of controversy surrounding its planning and development for the previous two decades. Joseph Montoya joined New Mexico state senator Tibo Chavez, District representatives, construction officials and members of the press to watch earth-moving equipment seal off the last portion of the natural channel of the Rio Grande. Even this ceremony demonstrated the complexity of work at Cochiti, because Atkinson employees had to release waters downstream as they trapped them behind the dam. The mid-valley irrigation season would begin again in March, requiring new channels to carry the streamflow. In addition, the Cochitis and other Pueblos [Santa Ana, San Felipe, and Santo Domingo] had informed the District that their religious beliefs dictated a constant flow in the river to maintain their continuity with the past. The Albuquerque District revealed how far it had come from the days of "condemnation" threats by placing a 36-inch pipe in the cofferdam to release 100 cubic feet of water per second. This display of respect for Pueblo traditions would signal better relations between the District and Cochiti, as evidenced by

the District's active recruitment of local people to work as rangers and maintenance personnel at the dam.[58]

As if to remind the Albuquerque District of the precarious history of Cochiti Dam, complaints came in to District offices as soon as the pool filled. Farmers who resided directly below the dam noticed that irrigation caused a rising water table that deposited poisonous salts onto their lands. Groundwater levels had increased eight feet since commencement of storage. The District sent investigators to the Pena Blanca area to observe the problem and determine the culpability of Cochiti Dam in the matter. Years of study and debate ensued among hydrologists, irrigation engineers, farmers, and the District over the causes and solutions. In 1980 Lieutenant Colonel Bernard Roth, District Engineer, informed an audience of concerned citizens in Pena Blanca that "intensive irrigation without adequate field drainage" was responsible for what Roth termed the "seepage" near Cochiti. The District Engineer believed that the Corps had no official authority to correct whatever problems existed, but hoped to find answers as a "technical service" to the community.[59]

Despite its alleged involvement in the rising water table, Cochiti Dam stood as a monument to the engineering skills of the Albuquerque District. In June 1979 the middle Rio Grande valley experienced a severe flood threat from the melting snowpack upstream from Cochiti. The storage pool normally hovered around 55,000 acre-feet in winter, but runoff increased the volume of water to 189,370 acre-feet by 21 June. Without the presence of Cochiti Dam, estimates were that downtown Albuquerque, by then a city of over 300,000 in population, would have received six feet of standing water from Rio Grade flooding. Cochiti Dam retained the entire quantity of flood water, thus preventing $33 million in damage to existing structures downstream. These savings amounted to more than one-third of the total project cost of $94.4 million, making Cochiti Dam a valuable asset to residents of Albuquerque and environs.[60]

The story of Cochiti Dam and Reservoir was a lesson in compromises, misunderstandings, pressures from natural disasters, and economic troubles. The argument and debate surrounding Abiquiu Dam paled in significance to the problems of Cochiti Dam, such that every benefit cited about the project could be met with a corresponding flaw. The city of Albuquerque and the Corps gained from its completion, as did central New Mexico irrigators, sportsmen and water enthusiasts. But the people who hoped to achieve the most from the project were the individuals upon whose land the dam rested: the citizens of Cochiti Pueblo. The dam promised economic prosperity, but instead delivered frustration, bitterness, and failure. The Albuquerque District had no role in this situation, but the repercussions from a scheme to develop homesites around Cochiti Lake gave the Corps more than its share of problems in the 1970s and 1980s.

When the Albuquerque District signed its memorandum of understanding with Cochiti Pueblo in late 1965, both sides expressed optimism that provisions for Corps-constructed and Pueblo-maintained recreation facilities would erase the memories of preceding disagreements. On the horizon appeared jobs at home for Cochiti residents, who commuted daily to work either in Santa Fe or Albuquerque. The loss of 3,500 acres of farm and grazing lands to the damsite made new economic opportunities a critical matter necessitating Corps construction of outdoor recreation sites. But historical forces at work in western recreation presented the Cochitis with a new concept in leisure actitives. Many postwar western water projects attracted developers eager to capitalize on the Eastern migrant's desire to experience outdoor sports in the desert, or to purchase

a second home near an attractive water source. Because Cochiti Lake had proximity to the population centers of New Mexico, several corporations expressed interest in creating yet another vacation-resort paradise for affluent urban dwellers from Albuquerque, Santa Fe, and other parts of the country.

The location, natural beauty, and free storage of water at Cochiti looked too good to be true for prospective real estate agents and clients. Then when the Albuquerque District agreed to furnish at no cost the basic recreational facilities, the potential at Cochiti Dam seemed unlimited. But two problems surfaced that would trouble any developer, and which ultimately dashed the hopes of many for Cochiti Lake. The first difficulty was the location of the development on Indian trust land. Legally the Pueblo could not sell its holdings without BIA and congressional approval. Any settlement around the lake would have to convince people who viewed private property as sacrosanct that they could only lease their spaces. This would make the resale of homes unprofitable, and jeopardize any future growth.

Besides the hindrance to private ownership, all residents would be subject to tribal authority rather that state or federal law. This concept had greatly disturbed the first American settlers who arrived in New Mexico in the 19th century, as their sense of individualism clashed with the lifestyle and political systems of the Hispanic and Indian peoples of the Southwest. The result was incessant demands for "self-government," meaning inclusion of New Mexico under United States domain. But under these new terms, all services would be provided and controlled by the Pueblo. This was a situation that non-Indians unfamiliar with the unique living patterns and governmental relationship of Indians could not be expected to comprehend.

The Indian land situation would have puzzled any potential promoter approaching Cochiti Pueblo. Questions of ownership, leasing and condemnation of Cochiti lands had confounded the Albuquerque District years earlier. But a factor less understood by outsiders that would haunt the development of Cochiti Lake was the uncertainity of the Cochiti people themselves over the wisdom of growth. Council members were sorely divided over the extent and direction of any development plans. Some thought that the future required full utilization of whatever resources the Pueblo possessed to ensure economic stability in the larger society. Others opposed any changes in Pueblo lifestyle as harmful to the rich cultural and social patterns that made Cochiti unique. As with most native communities in the 20th century, however, the majority anguished over two unclear choices: the world as they thought they knew it versus a future that no one could define.

The decisive factor in Cochiti Pueblo's acceptance of development was pressure from influential political figures whom the Pueblo assumed knew best in these matters. Interior secretary Stewart Udall believed that a recreation and homesite plan offered the only economic hope for the Cochitis, and he visited New Mexico on several occasions to speak to that objective. Joseph Montoya also envisioned growth for his hometown of Pena Blanca, which would strengthen his family's financial status via land sales and construction work. The western "booster spirit" prompted editorial writers in Santa Fe and Albuquerque newspapers to support the development, and the Cochiti council receive much advice on the "guaranteed" profits that recreation had provided elsewhere.[61]

The "winner" in the contest to maximize the potential for Cochiti Lake was the California City Development Corporation [CDCC]. Based in Los Angeles, CDCC was known for its leisure community of "Colorado City" southwest of

Pueblo. The firm was one of many organizations to imitate the success of Del E. Webb, the southern California developer of Sun City, Arizona, and other self-contained villages for retired or wealthy people in the desert Southwest. CDCC met with Cochiti officials soon after the Albuquerque District promised full financing of the recreational sites at Cochiti Dam. CDCC entered into two and one-half years of negotiations with the Pueblo that culminated in an agreement signed on 15 April 1969. CDCC outlined an elaborate proposal to construct 15,000 permanent homesites on 7,500 acres of Cochiti land. The company would actively recruit purchasers of the leased homesites, publicize the attractions of Cochiti Lake, and assist the Pueblo in maintenance of its recreational facilities. According to CDCC, the projected population of the "Town of Cochiti Lake" would reach 50,000 people by the summer of 1983. In essence the developer hoped to form a community the size of Santa Fe in less than 15 years, despite all the restrictions on Cochiti land use.[62]

The first obstacle confronting CDCC was the Nixon administration budget for 1970. Because the Albuquerque District could not gain its appropriations for immediate construction of the dam, CDCC's scheme for advertising the development stood in jeopardy. When asked by Celso Montoya, governor of the Pueblo, for details of the plan to demonstrate to Congress the need for continued Corps funding, CDCC released figures that looked most impressive. N. K. Mendelsohn, president of the firm, estimated that 250 people would be employed in construction and promotion, generating an annual payroll of $2 million. The numbers grew larger when Mendelsohn conceived of "tens of thousands of visitors" lured to Cochiti by the $500,000 annual advertising program of CDCC. Once completed, the town of Cochiti Lake would attract industry, commerce, and trade to an area lacking in all three. But CDCC believed that the Nixon budget office endangered these plans and denied CDCC the opportunity to provide "the new industrial base that the Cochiti region needs so very much."[63]

The budgeting problems of 1970 eased for the Albuquerque District, but proved to be a harbinger of crises to come for CDCC and the Pueblo of Cochiti. The New Mexico Attorney General disliked establishment of an Indian-controlled town exempt from state laws and regulations. The Attorney General filed suit in December 1970 against the Interior department to invalidate the charter for the Town of Cochiti Lake, only to negotiate a later agreement whereby the Pueblo offered all services required by state statute. Further restricting development was the decision of the Albuquerque District to limit the speed of power boats to less than ten miles per hour. Acting on the advice of the state engineer and state game and fish department, the District believed that "no-wake" boating would increase the visitor-days of fishermen at Cochiti, at the expense of water-skiers who lacked the political clout of sportsmen. Water-sports enthusiasts had more money to spend on summer homes and boating equipment, and would find the District-enforced calmness of Cochiti Lake's waters unappealing to their lifestyle.[64]

The problems only increased for CDCC, which became Great Western Cities after its merger with a California conglomerate known as Great Western United Corporation. Great Western found its homesites hard to sell, even though Clinton Anderson had sponsored an amendment to the Cochiti legislation that increased the period of leasing at the lake from the 50 years preferred by the Pueblo to Great Western's demand for a 99-year arrangement. Two factors stood in the way of Great Western's success: the unique features of Cochiti land tenure and the economic recessions and fuel crises of the the 1970s that reduced

tourism. District employees commented upon the "hard-sell" techniques of Great Western, which transported busloads of prospective customers to Cochiti Lake for brief inspection tours and high-pressure sales pitches. Those individuals who did build homes at the site found the company strapped for cash and unable to complete the utility, sewer, and road connections promised by the company's salesmen. Court suits followed, with Great Western forced to rebate percentages of its profits to disgruntled owners and to finish work on its infrastructure at Cochiti Lake.

The declining fortunes of Great Western meant that the promises made to Cochiti Pueblo could not be met, and that disillusionment would lead to conflict. The Pueblo subleased its recreation concessions to Great Western, whose failing situation left it with little desire to upgrade recreational faciltities. Great Western also charged user fees for boating and picnicking which further discouraged visitors who received these benefits free at other federally constructed water projects. Then in the spring of 1983 the Pueblo council learned from Great Western that it no longer wanted to maintain the recreational sites at Cochiti Lake. The council had neither the expertise nor monies to undertake this task, and asked the Albuquerque District to assume all recreational functions just prior to the summer tourist season. To increase usage, the District immediately dispensed with all fees, opened the facilities to the general public, and staffed Cochiti with District employees trained in recreation and resource management.[65]

The construction and maintenance of Cochiti Dam by the Albuquerque District offers several lessons for students of western and New Mexican history. The growth patterns of the postwar Southwest tantalized many individuals hoping to profit from the expansion of cities and towns. But the haste to provide living space for the newcomers taxed the resources and imagination of all agencies mandated with delivery of public services. Cochiti Dam did not enter into the thinking of the District until the 1950s when the middle Rio Grande valley attracted tens of thousands of migrants seeking the good life of Sunbelt prosperity. Many of these same individuals wanted the lifestyle that they had known in more humid climates to complement their new desert environment. All of these people needed flood protection and improved supplies of industrial and domestic water. Cochiti Dam suddenly became a high priority for the District, and the rocky road traveled by its planners and managers can be linked to its location and historical significance.

The circumstances affecting the Cochiti people are no less illuminating in the story of promises made and broken. Although the Albuquerque District played no role in the fiasco of Cochiti Lake development, its earlier involvement in negotiations with the Pueblo taught the District to appreciate the complexity of Cochiti life and to sympathize with its problems with Great Western Cities. This attitude helped avert confrontations when the developer relinquished its recreational work, and when problems arose on Cochiti lands that had the same flooding problems as Pena Blanca. The council filed suit in United States District Court for $10 million against the District for "waterlogging" 320 acres of Cochiti farmland. The District made attempts to resolve the dispute through testing and negotiations, rather than resort to the more brusque style employed in the 1950s.[66]

The story of Cochiti Dam typified the uniqueness and variety of experiences under which the Albuquerque District operated in its first half century. The dam protected many individuals from disaster in major metropolitan areas, and

demonstrated the District's capability in constructing water projects on a massive scale. But the District could not avoid the pitfalls of history in New Mexico, where local and state officials utilized organizations such as the Corps to generate economic and social benefits that private enterprise either could not or would not develop.

The changes brought by the postwar years also confounded the Cochiti people, who in some ways were as uncertain about the future as the Albuquerque District. The jobs for Cochiti residents never materialized, recreation became a great burden, and in March 1984 Great Western Cities padlocked its offices at Cochiti Lake and declared bankruptcy. Some critics contend that this incident only proved that the Albuquerque District had constructed a facility that never should have existed. But the story of the project dramatizes the competing interests in the Southwest that led the Albuquerque District to build Cochiti Dam and Reservoir. Only when all groups realize the complexity of structures such as Cochiti will its full value be appreciated, and its errors be avoided in the future.

IX

LOCAL FLOOD PROTECTION IN THE ALBUQUERQUE AREA

To many Southwesterners, the primary civil works mission of the Albuquerque District has been construction and operation of mainstream dams and reservoirs in the major river basins within its jurisdiction. Public awareness of Army Engineer work rarely goes beyond the recreational potential of Cochiti, Abiquiu, Conchas or Santa Rosa Dams. But a related activity as crucial to the economic security of the states comprising the District is the combination of river levees, detention dams, and storage reservoirs that complement the larger structures. Individual communities needed protection against the flash flooding so common to the desert and mountain Southwest, and retention of spring runoff behind large dams. Without adequate measures taken to avoid the random devastation of floodwaters, such facilities as Conchas or Abiquiu would be meaningless, and the hundreds of millions of dollars spent on flood control might be wasted.

The Albuquerque District faced all the problems inherent in large water projects when it undertook survey and construction of local flood control facilities under its purview. This meant designing adequate facilities in desert, mountain, and high plains environments, each with its own distinctive patterns of topography, geology, climate, and stream flows. The work was of pressing concern to local interests, who saw in the Corps a savior from economic destruction and conversely a protector of local schemes for development. The history of the West is filled with examples of boosters building communities in floodplains, as these offered the most level and accessible lands. When the Albuquerque District could not justify protection in such circumstances, local officials often took issue with the Corps, rather than reassessing their own lack of foresight.

For the District itself, questions of engineering and local politics presented only some of the obstacles to local flood protection. The District had to maintain its heavy military construction authorizations in the 1950s and 1960s, and its commitment to large storage reservoirs as linchpins in the defense against flooding. Budget crises threatened levee and channel work as with other projects, further hampering the success of these endeavors. Local patterns of water usage, defined in compact agreements with New Mexico, Texas, and Colorado affected decisions about the scale and expense of Corps work. Finally, the earlier presence of the Bureau of Reclamation in all the basins of the Southwest promised bureaucratic conflict as severe as that involved with Cochiti and Abiquiu dams. Solutions to these problems would tax the imagination and patience of the Albuquerque District from the first studies in the Depression through celebration of the District's golden anniversary in 1985.

Because of its concentrated population, its housing of the Albuquerque District headquarters, and the power of its local and state politicians, the Rio Grande basin above the confluence of the Rio Pecos received the bulk of the District's attention. From Creede, Colorado to El Paso, Texas, the Corps planned

and implemented over a half-dozen projects to complement the protective features of Abiquiu and Cochiti Dams. Until the stimulus of World War II sent the population of the middle Rio Grande valley soaring, the federal government had taken little interest in matters of flood protection in the region. Formation of the Middle Rio Grande Conservancy District [MRGCD] in 1925 dramatized the community's concern over the increasing siltation of the streambed, and the need for additional irrigated acreage to support the then-slowly growing populace. MRGCD could not carry the burden of flood protection very long, either financially or logistically. Thus the plans of Clyde Tingley, Dennis Chavez, and Clinton Anderson to strengthen the local economy of their hometown of Albuquerque meant inclusion of local levee and channelization work in any study undertaken by the federal government.

The devastating flood of May and June, 1941, brought the Army Engineers to the Rio Grande basin to suggest corrective measures. From its report of 1948 came plans for greater flood protection with reservoirs at Jemez Canyon and Chamita. Also included were recommendations for local work on the two sections of the Rio Grande basin: the Rio Grande Floodway, and the Bluewater-Toltec Floodway on the Rio San Jose, which flows into a tributary known as the Rio Puerco. To avoid disagreement with the Bureau of Reclamation, the Memorandum of Understanding of 1947 divided the tasks between the Corps' levee construction and the Bureau's channel rectification. Local interests hoped that the Rio Grande streambed could be lowered, the channel capacity increased materially, and the heavy indebtedness of the MRGCD alleviated.[1]

With completion of the Albuquerque District studies, the Corps convinced Congress in 1950 to authorize the Rio Grande Floodway as part of the Middle Rio Grande Project [MRGP]. This area extended from a point 14 miles north of Espanola, where the narrow Rio Grande gorge widens at Velarde, to Hot Springs, New Mexico, where the Bureau of Reclamation trapped Rio Grande waters behind Elephant Butte Dam. The distance is 270 miles, with a variety of private and state levees and dams scattered throughout the valley. These lacked uniformity of size, durability, and strength, something the District hoped to eliminate with its projected budget of $11.5 million.[2]

In its plans for the Rio Grande Floodway, the District quickly encountered the classic problems facing all New Mexico water projects: the threat of flooding versus local inability to contribute to the costs. The Corps wanted to spend only $3 million of the overall budget, because its major investments at Jemez Canyon and Chamita were essentially free to the inhabitants of the middle valley. The Corps also followed a Congressional mandate that required more cost-sharing where local interests benefitted most from flood protection work. The MRGCD had yet to repay the operations bonds purchased by the Reconstruction Finance Corporation in the midst of the depression, and could not generate additional revenues easily. Other communities were even less able to bear the burden of the 70 percent local costs. Given those realities, the authorizations of the 1950 Flood Control Act meant that only the large storage projects moved forward. This was a policy which the District could support, but which angered local leaders who feared springtime runoffs and summer cloudbursts.

To expedite construction of the Rio Grande Floodway, civic and political officials of Albuquerque prevailed upon Chavez and Anderson to amend the 1948 and 1950 Flood Control Acts. The levees built with MRGCD money suffered from extensive erosion, and the District believed that it had to reconstruct the system in its entirety. The original studies had anticipated the presence of

Chiflo and Chamita dams upstream to regulate the flow of the Rio Grande. With strong political opposition from Texas water users, the Rio Grande Floodway analyses required overhaul.

In addition, Colonel Herbert D. Vogel, Southwestern Division Engineer, admitted that the Albuquerque flood control report of 1953 had become "a source of embarrassment to all of us because of faulty conclusions arrived at some years ago." The city's growth had been unexpected, and the scheme to protect 270 miles of river for only $11.5 million was insufficient. Vogel approached Dennis Chavez for help with the Public Works subcommittee, and the Senator offered to reduce the Rio Grande Floodway plan to include only Albuquerque. "I found the Senator most agreeable to certain proposed changes," the Division Engineer reported to the Office of the Chief of Engineers, "and he will request a resolution . . . which will get us off the hook."[3]

To meet the needs of the city of Albuquerque, the Corps supported passage of House Resolution 9216, which Congress adopted in 1952. This bill fashioned a modified plan with two diversion channels to carry summer runoff from the Sandia mountains west to the Rio Grande. The combined length would be 15 miles, at an estimated federal expense of $7.5 million, with the city accepting the costs of rights-of-way, maintenance, and legal responsibility. This agreement led to formation in 1952 of the Sandia Conservancy District, when a New Mexico District Court gave it authority to issue bonds, condemn lands, and negotiate with the Albuquerque District for construction of the diversion structures. This package of financial and political support met with the approval of Congress, which authorized the Albuquerque Diversion Project [ADP] in the Flood Control Act of 1954.[4]

The severity of flooding from the mountain areas of Albuquerque had not been a major concern before the growth of the postwar years. Runoff from the west face of the Sandias rushed down dry arroyos to the Rio Grande. In June 1952, floodwaters in Embudo Arroyo and Campus Wash caused an estimated $348,000 damage to homes and businesses. Once these waters reached the valley, they could not enter the Rio Grande because siltation had caused the riverbed to rise above the natural channels of its tributaries. The MRGCD had drilled several drainage outlets, but these proved ineffective. The flood waters "ponded," or collected in pools in the low-lying areas of the North and South Valley, and became breeding grounds for mosquitoes. The overflow from septic tanks and outdoor toilets added large amounts of fecal matter to the ponds, creating severe health hazards. Until the waters either evaporated or seeped into the water table, they remained on the surface for weeks at a time, adding to the problems already created by the flows of the runoff.[5]

The Albuquerque District encountered two problems as it began to fulfill the stipulations of the 1954 Flood Control Act. Local residents had become accustomed to federal assumption of all costs of flood protection in the Rio Grande valley. Thus they resisted Sandia Conservancy District attempts to levy taxes to meet the Corps' modest fiscal requirements. In addition, after 1945 the city of Albuquerque permitted developers to encroach upon watersheds and low-lying areas to build homes for the thousands of new residents. The District asked the city to enact restrictive zoning codes to spare additional areas from damage. Because this meant removal of most of the desirable locations for development in the fast-growing metropolitan area, city fathers preferred to ignore District requests and instead asked their political leaders to find solutions.

This latter question of unchecked development first surfaced in the 1954 re-

port of the District to Congress. The MRGCD had drained swampy acreage for irrigated farming, which became attractive for subdivisions after the war. The droughts of the 1930s and the early 1950s also lowered the volume of runoff, which the District said "encouraged further development within the ponding areas." The District also recognized the city's support for housing in the Northeast Heights and the Kirtland AFB area, estimating this growth to double by the year 2000 and increase the amount of damageable property. In the early 1950s the major area of destruction was the South Valley, but in the future expensive homes in the Heights would be washed away if the city codes were not enacted and rigidly enforced.[6]

Even though the District only asked that local residents put forth $170,000 towards the $7.5 million cost of ADP, the Sandia Conservancy District had no luck acquiring that figure from the voters of Albuquerque. Hispanic leaders in the lower valley claimed that the laterals protected the Anglo-dominated Heights section of the city at their expense, citing as examples municipal authorization of new housing starts in spite of the Corp's warnings. OCE took a dim view of this behavior and refused to include full funding of ADP in its budget until the city changed its mind.

This action placed Senator Dennis Chavez in an awkward situation with the Corps. General Samuel D. Sturgis, Chief of Engineers, held the Public Works committee chairman in low regard for his handling of committee hearings on nationwide Corps projects. Chavez knew this and was reluctant to cross the general with demands for action on the ADP. When Albuquerque city leaders pressured him for a "temporary" dam in Embudo Arroyo that would cost $250,000, Chavez told Sturgis that he would not support it. The chairman informed OCE that if he were "instrumental in having this project constructed [he] probably would be pressured to build similar dams in other arroyos to the north." Chavez "was doubtful if [the dam] would be politically expedient," and took the highly unusual position of opposing a measure deemed by his community as central to their interests.[7]

The decision by Senator Chavez to reject Embudo Arroyo Dam caused a major crisis for ADP. The Corps completed work on shoring up flood levees through the city of Albuquerque, but would ask Congress only for study funds for the lateral channels. Albuquerque argued that its tax revenues could not be increased to meet the costs of ADP, and that rains in the summer of 1955 added to the totals of destruction without flood protection. Harold E. Kious, finance director for the city, complained that "the financial resources of Albuquerque, New Mexico, have always been below the average of cities of comparable size due to the size of the low-income group." Without federal assumption of the ADP, the city would lose its attractive status for government agencies and white-collar employees, and the labors of Clinton Anderson and others for federally sponsored growth would be in vain.[8]

The pleas of Albuquerque reached New Mexico Governor John Simms, who ordered his state engineer to recommend "stopgap measures" for the city and a thorough analysis of the Corps' intransigence on the matter of funding and construction of ADP. Steve Reynolds noted that Robert C. Woodson, Chief of Planning for the Albuquerque District, had suggested building what Reynolds called the "Woodson wall" around homes in vulnerable areas. District officials believed that a sandbag perimeter, three to five feet high, could be placed five feet from each home, with front and rear openings that could be covered quickly. Woodson then suggested a small gasoline-powered pump to remove any seep-



Plate No. 32. Local Flood Protection on the Rio Grande near Corrales, New Mexico

age or runoff from the roof of the home. Woodson estimated the initial cost per home at $300. Bob Woodson's suggestion was poorly received by the public, however, which considered flood control a federal matter and the sandbagging of their property aesthetically unappealing.[9]

Because the Woodson plan met public resistance, Reynolds recommended utilization of a city master plan for flood protection. "The major offenders," said the state engineer, were "the promoters who built in the areas which should never have been allowed to develop until adequate flood protection measures were installed." If the city could demonstrate to the Corps its willingness to manage its growth with a flood control plan, the federal government might be more inclined to assume the burden of financial support, as it had done with mainstem reservoirs elsewhere in New Mexico.[10]

The standoff between the city and the Corps over ADP reached its peak in the budget hearings for fiscal year 1959. The same scrutiny of the Eisenhower administration that jeopardized Abiquiu Dam that year caught ADP in its trap as well. The MRGCD became distraught when representatives of OCE told visiting Albuquerque officials that the diversion project had to wait until completion of the Abiquiu and Cochiti studies. The Office of Chief of Engineers then dropped a bombshell on the local interests when it claimed that "to do any strengthening of the levees at this time would create a false sense of security" in the city. The Corps feared that its improvements would "promote costly developments in the immediate area which could be wiped out by a flood." The MRGCD was "terribly disturbed and worried" over the Corps' position, and took exception to the "shopworn comment" about the lack of flood plain management.[11]

Albuquerque officials decided to break the impasse over Rio Grande Floodway funding by appealing directly to the final authority on federal budget matters: President Dwight D. Eisenhower. New Mexico Governor Edwin L. Mechem reminded the President of the Congressional legislation for ADP, and the cooperation of the Corps and Reclamation to make the Rio Grande less prone to violent flooding. Eisenhower's Budget office had given Reclamation $1 million for its share of the work and none to the Albuquerque District. Mechem considered this action "inconsistent and contradictory." The governor also disliked the Corps' delay in requesting ADP funds until review studies came in on mainstem dams. "I am firmly convinced," Mechem contended, "that the facts do not support [OCE's] position in the matter." The Albuquerque District personnel worried that new flood levees would wash out if no reservoir existed to catch standard project flood runoff in excess of 20,000 cfs. The governor informed the President that "such floods [had] occurred only once in 30 years," and that New Mexico considered the risk "insignificant when compared to the present danger at moderate flows of high frequency." Mechem asked Eisenhower to intervene in the case by restoring $550,000 to the Albuquerque District for levee and channel improvement.[12]

The Eisenhower letter precipitated a flurry of correspondence between the White House and the Governor's mansion in Santa Fe. Presidential assistant Sherman Adams responded to Mechem on behalf of Eisenhower with no promises of immediate relief. Adams relied upon OCE documents to demonstrate the need for "a realistic design and estimate of cost for the entire floodway." Adams reminded Mechem that the President wholeheartedly supported another important New Mexico water project, Navajo Dam and Reservoir, and that his budget requested $7 million for its construction in fiscal year 1959.[13]

Adams' response of 14 March 1958, did not please Governor Mechem, who could only assume that Eisenhower had received faulty advice on ADP. "I am fearful," he told Adams, "that the information given to the President and to you doesn't fully disclose the engineering and judgement factors involved." The work suggested by the Albuquerque District would not be threatened by major flood flows, even though the District wished to restrict the Rio Grande to 5,000 cfs with Cochiti Dam. Mechem knew that Texas opposition would delay the construction of upstream reservoirs for a long time, and that there was "no justification for permitting life and property . . . to remain in great jeopardy" while Congress debated the merits of other New Mexico projects.[14]

The White House staff believed that it had done all that it could on the ADP matter, and became impatient with New Mexico's persistence. "The Corps of Engineers," Sherman Adams wrote on 8 April 1958, "is simply not in a position to complete planning on the authorized floodway units." Were the Albuquerque District to move forward prior to construction of Cochiti Dam, the result "could lead to later costly modifications as well as a false sense of security from flood losses." Eisenhower "regretted" that a "higher degree of flood protection" could not be foreseen in the immediate future, but fiscal contingencies and presidential dislike for large water project budgets would affect any further considerations of ADP.[15]

As if opposition from the White House were not enough, local property owners rose to challenge the methods used by the Sandia Conservancy District to pay the local share of ADP. The New Mexico state legislature had authorized formation of such entities under its "Conservancy Law," allowing for private organizations to negotiate with the federal government on flood protection. In conformance with the state statute, Sandia had to file an appraisal report in district court prior to commencement of work. The conservancy district did so in September 1957, believing that the majority of Albuquerque residents supported its rates of taxation.

In October of that year a group of homeowners protested Sandia's methods of assessment, and filed suit to block implementation of the agreement with the Albuquerque District. The following August the court held for the plaintiffs and rejected the report submitted by Sandia. Albuquerque thus had no federal funds for ADP, and no means to generate local revenue. On 21 November 1958, the Corps struck another telling blow at the project by officially informing Sandia that it had five years in which to secure the necessary funds and rights-of-way. Otherwise the District would be forced to terminate all planned work in the city. The Corps halted its operations at once, and returned the unused portion of ADP study money [a total of $60,000] to the federal treasury.[16]

For the next four years the ADP languished as local citizens could not agree on funding flood control for Albuquerque. The deadline for revival of the project approached in 1963 when Governor Jack Campbell delivered a Special Message to the New Mexico State Legislature in support of creation of the Albuquerque Metropolitan Arroyo Flood Control Authority [AMAFCA]. Spring rains that year brought renewed flooding to the city, which now exceeded 200,000 in population. Cochiti Dam above the city looked no nearer to construction, and so the state allowed AMAFCA to resume negotiations with the Corps after dissolution of the Sandia Conservancy District in 1962. AMAFCA called for issuance of bonds totalling $9.5 million, which voters approved on 27 August 1963. The Albuquerque District immediately restored ADP to active status and accepted AMAFCA funds on 19 November, two days before expiration of the five-year

grace period for the project.[17]

With acquisition of AMAFCA support and monies, the Corps reinserted ADP in its budget request for fiscal year 1965. Inflation and expanded study had increased the total cost to $24.5 million, of which nearly 40 percent had to be local funding. The north diversion channel was completed first, leading Hispanic residents awaiting the southern channel to charge discrimination and favoritisim on the part of the Albuquerque District. By 1969 costs had risen to $32 million, with still no south diversion channel. Then the Nixon budget reductions delivered a stunning setback to the city, as they had to Cochiti Dam. That year Governor David M. Cargo testified before the Senate Public Works subcommittee that delays in construction of flood protection for the Hispanic South Valley threatened low-income neighborhoods targeted for rehabilitation by the federal Model Cities program. "In this case," the governor warned, "high priority social objectives are being jeopardized by cutting funds for water resources projects."[18]

Despite the many obstacles which ADP presented to the Corps, the work on both channels concluded in March 1972, two decades after Congress first authorized local protection for Albuquerque. Because city residents in 1954 had not agreed on what amounted to a free federal gift, their bonded indebtedness leaped dramatically once construction finally began. While no other portion of the Rio Grande Floodway would equal ADP in costs or contentiousness, the Albuquerque portion of the project did set a tone for later district work from Espanola to El Paso. By 1984 the district had constructed protection levees, dams, and channels at Socorro, Las Cruces and El Paso. The original 1948 report on Bluewater Floodway never did reach the construction stage, as early plans to build dams on Laguna and Isleta Pueblo lands met opposition from the Bureau of Indian Affairs and tribal members. Then in 1984 the District requested $39 million to finish its work on the Rio Grande Floodway, only to have the appropriation stricken by President Reagan's veto of all federal water projects in October.[19]

X

THE PECOS RIVER BASIN

Because of its central location in New Mexico, its large volume of water, and its temperate desert climate, the Rio Grande basin attracted most of the New Mexican settlement from pre-Columbian times to the 20th century. This gave it a high profile in the planning of the Albuquerque District. But a Congressional mandate of 1938 directed the Army Engineers to study flood protection and water conservation for another important New Mexico river, the Pecos. The Pecos Basin's density of population was far less than the Rio Grande, its high Plains climate more diverse, and its problems of water usage more complex. By accepting work in the Pecos basin in 1942, the Albuquerque District embarked upon a series of drawn-out discussions, debates, and surveys that would result in flood protection plans for Alpine and Pecos, Texas, Carlsbad, Roswell, Artesia, and Las Vegas, New Mexico, and the construction of a mainstem reservoir north of the town of Santa Rosa.

The Pecos basin is only slightly less fabled in song and story than its companion to the west, the Rio Grande. The Pecos River originates high in the Sangre de Cristo Mountains east of Santa Fe above the old Pueblo community of Pecos. It flows southward for over 700 miles through the arid high plains of eastern New Mexico and far west Texas, and enters the Rio Grande east of Big Bend National Park on the Mexican border. Prior to the arrival of the Spanish in the 16th century, the river served as a source of water for hunting camps of Apache and Comanche bands following the buffalo herds. Several villages of Pueblo Indians diverted Pecos streamflows to irrigate small tracts as far south as Puerto de Luna, below present-day Santa Rosa. The majority of native farmers in the basin lived near the community of Cicuye, renamed Pecos by the Spanish.

The first Europeans to cross the Pecos River were the members of Coronado's party in 1541, in search of the cities of Quivira to the east. In 1583 the Spanish government tried to establish a route to the northern Pueblo villages by traveling north from Mexico along the Pecos. This first expedition was led by Antonio de Espejo, who called the river "El Rio de las Vacas" [the river of the cows] because of the large herds of buffalo in its vicinity. Don Juan de Onate is first credited with naming the river the Rio Pecos, but only the upper basin held that name. In the 18th century Gaspar Costanso de Sosa called it the Rio Salado [salty river], because of the high volume of salt and sediment that made it unfit to drink. Other Spanish maps called the lower basin the Rio Puerco [dirty river] for its turbulent condition.[1]

The problems of water use and abuse that would plague the Albuquerque District in its 20th century studies of the Pecos basin appeared soon after the establishment of large farms in the 1880s. The agricultural techniques necessary in the Pecos valley required cooperation to build dams, reservoirs, and canals. In 1888 the Carlsbad Irrigation District [CID] incorporated, encompassing

25,000 acres from north of Carlsbad to the New Mexico territorial boundary. The CID built private reservoirs at Avalon and McMillan dams in the 1890s, but floods continually damaged these structures until 1906 when the newly created Reclamation Service assumed management of the facilities from the CID. At that time a private company also took control of the long-neglected Bosque Redondo system near Roswell, renaming it the Fort Sumner Land and Canal Company. This group went bankrupt in 1918, and sold out to a consortium of local water users who called themselves the Fort Sumner Irrigation District [FSID]. The presence of these two companies, and the competitive nature of their relationship in the Pecos basin, would hinder many Corps attempts to plan flood protection and construct the reservoir at Santa Rosa.[2]

The Army Engineers had little interest in the Pecos valley until the Depression brought federal involvement into many western river basins. The Bureau of Reclamation began construction of a major irrigation facility some 50 miles south of Santa Rosa, naming it Alamogordo Dam for a creek that entered the Pecos above the structure. Reclamation did not take into account the space needed for flood control storage, and the 1937 Pecos flood would have destroyed the dam had it been finished at the time. The lack of gates or valves permitted the runoff to pass unencumbered, but future occurrences would be far more costly. The floodwaters also inundated portions of Roswell, Artesia, and Carlsbad. Local officials called upon the federal government to offer solutions, and the Flood Control Act of June 28, 1936, assigned the Pecos work to the Galveston District as part of its management of the Texas reaches of the Rio Grande.[3]

Engineers from the Galveston District worked with representatives of Reclamation as part of the Pecos River Joint Investigation. The Flood Control Act of 1939 ordered the Corps to determine the flood control capability of the Alamogordo Reservoir, and to recommend changes in the structure to fit OCE specifications. Galveston conducted tests of nearly one dozen sites for new reservoirs, and drew contour maps of the entire basin. Its final report on the Pecos went to the Board of Engineers for Rivers and Harbors on 30 March 1942, suggesting a combination of multipurpose reservoirs and local flood protection features. The Natural Resources Planning Board reviewed the Corps report, and concluded: "For its size, the basin of the Pecos River probably represents a greater aggregation of problems associated with land and water use than any other irrigated basin in the western U.S." The Board of Engineers for Rivers and Harbors concurred, ruling that the cost of reservoirs greatly exceeded benefits, and that the federal government would support only local protection.[4]

The Pecos report went back to the Galveston District for restudy, but by that time OCE had decided to include the Pecos basin within the jurisdiction of the new Albuquerque District. The 1944 study met with opposition from local and regional political leaders, necessitating yet another review in 1945. This time the Albuquerque District became aware of the lack of cooperation on the river between the various irrigation companies, and between New Mexico and Texas. The District informed Pecos water users that acceptance of a binding compact as detailed as that for the Rio Grande would be the only way that the Corps could work in the basin. Otherwise the District would encounter legal challenges that had become a way of life for the Pecos basin.

The question of a workable Pecos River Compact had surfaced more than 20 years earlier, when the successful negotiation of the Colorado River Compact in 1922 spawned a series of similar accords throughout the arid West. New

Mexico and Texas reached a compromise on usage of the Pecos in 1925, which the Texas legislature ratified that year. It soon became apparent that Texas had achieved the better bargain, since it claimed prior appropriations to the streamflow since the 1880s. New Mexico had not developed its lands in the Pecos basin to the same degree, and feared that future use of New Mexico water would be hampered by Texas demands. New Mexico thus rejected the original compact, leaving the basin without the proper regulation needed by the Albuquerque District for its operations. Texas retaliated by disavowing the Canadian River Compact of 1927, and left matters hanging when the District began its surveys in the mid-1940s.[5]

The Corps' warning about Pecos water usage forced the two states to convene the first meeting of the Pecos River Compact Commission in Santa Fe on 22 July 1943. A.H. Dunlap of the Texas Board of Water Engineers joined with New Mexico State Engineer Thomas McClure, and Berkeley Johnson, District Engineer for the U.S. Geological Survey in Santa Fe, to form the negotiating team. Soon thereafter Dunlap died, requiring Texas to replace him with Charles Miller. This delayed any substantive meeting until October 1945, by which time the Board of Engineers for Rivers and Harbors had turned down two Pecos survey reports. Texas finally suggested dividing the streamflow to provide itself with "a daily volume of water equivalent to 58.7 percent of the waters daily measured at the highest gauging station on the Pecos River". New Mexico found this figure "entirely unacceptable," as it rested upon insufficient data collected by the Texas Water Commission.[6]

While the compact members met to resolve their differences, the Albuquerque District moved forward with its latest studies of the Pecos basin. The Bureau of Reclamation wanted to rebuild Alamogordo Dam to hold 198,000 acre-feet of water, of which 98,000 went to flood control and the rest to irrigation and sedimentation. The Bureau also wanted to manage the flood releases, at the rate of 6,000 cfs. The Albuquerque District contended that such volumes of water would aggravate flood threats below the dam, and Lieutenant Colonel Reuben Cole, District Engineer, told Reclamation that "such release procedure is considered undesirable by this office." The Bureau and the Corps disagreed over several other plans for the Pecos, creating the same threat of bureaucratic warfare that endangered the Middle Rio Grande Project to the west.[7]

As the District dealt with Reclamation and the compact commission, it also entertained requests from local interests concerned with the delays in protection. Hub Kane, publisher of the *Las Vegas* (NM) *Optic,* went with New Mexico State Senator Elmer F. Moore to Washington in 1945 to ask OCE for flood control projects in the Upper Pecos basin. Kane sought three reservoirs on the Mora River, and dams on the Gallinas River near Las Vegas, at Romeroville, and on Tecolote Creek south of Las Vegas. The District conducted a brief study of the area, concluding that the primary benefits accrued to irrigation users, and that flood damage was "of a very minor nature." The District advised the editor to solicit the help of Reclamation, and that the Corps might give advice on flood control storage if needed.[8]

The Las Vegas incident convinced many New Mexico officials that two events had to occur on the Pecos to achieve worthwhile water resource management. One was agreement between the Bureau and the Corps to share the workload, and the other a compact allowing the Corps to assume construction at once. New Mexico felt that Texas had to bend somewhat in its position on the compact and take more responsibility within its borders to conserve precious

water. New Mexico suggested additional reservoirs on the Pecos below the state line, and sought permission for New Mexico to do the same. The Bureau of Reclamation and the Albuquerque District thought this plan a wise one, and encouraged Texas officials to accept the arrangement.[9]

The opportunity for a compact soon faded as Texas assessed the consequences of reservoir construction in New Mexico. Roswell interests wanted flood control works on the Rio Hondo, a stream that originated in the Sierra Blanca range west of town. Texas believed that waters stored there would percolate down into the Roswell Artesian Basin, rather than flow southward for delivery at the state line. New Mexico had a unique groundwater law that considered subterranean waters separate from streamflow. Texas would have no claim to these waters if they did remain in the basin, and was not reassured by Reclamation statistics demonstrating a return of excess runoff into the Pecos. In 1947 Texas devised plans to sue New Mexico in court over the Rio Hondo flood project, creating one more obstacle to an early and reasoned solution to Pecos water usage.[10]

The animosity Texas held for New Mexico also created hazards for the Albuquerque District. Texas carried its fight to the newspapers of the region, condemning any Corps projects in New Mexico as partial to that state's interests. New Mexico criticized the Democratic-leaning Lone Star state for currying favor with President Harry S Truman, and holding hostage all New Mexico facilities until Texas and New Mexico signed a compact favorable to the former. A similar situation had existed when Texas fought Alamogordo Dam with the blessing of Interior Secretary Harold Ickes. The chairman of the New Mexico Interstate Stream Commission called Texas's behavior "another example of Texas politicians playing to the limit their nuisance value as adherents of the present Democratic administration," and singled out U.S. Senator Tom Connally for his "arbitrary, unreasonable and Stalin-like tactics." The chairman longed for a "Republican majority in Congress" to "see that fair play is had," and that "for once all of the political pressure of Texas would not be sufficient to obtain a presidential veto." [11]

The reaction of OCE towards the Pecos controversy was predictable. The Southwestern Division agreed with the Albuquerque District that flood protection on the Pecos had a high priority. But Colonel Henry Hutchings, Jr., Division Engineer, considered it neither "practicable nor desirable" to move forward with Pecos plans until the signing of a compact. The New Mexico state engineer suspected that Texas water interests had coerced the Dallas-based Hutchings to halt all Pecos work, and had tried to convince the Division that a comprehensive plan of basin development would accelerate the drafting of a compact. When Hutchings did not change his mind, Thomas McClure, New Mexico state engineer, fired off a letter to U.S. Senator Carl A. Hatch, as did several water officials from the Pecos basin.[12]

A fortuitous chain of events aided the cause of New Mexico in the Division matter and broke the stalemate over the Pecos River Compact. Senator Hatch chaired a special subcommittee empaneled to review Corps' plans for construction of the St. Lawrence Seaway. A treaty between the United States and Canada to effect such a project had met Canadian opposition. Certain groups demanded postponement of any Corps studies until all international questions had been resolved. As Hatch listened to Lieutenant General Raymond A. Wheeler, Chief of Engineers, testify in favor of continued Corps surveys regardless of the treaty's status, the Senator held in his hand the letters of Thomas McClure and

the statement of Colonel Hutchings on the Pecos dilemma. Hatch interrupted the Chief to read to him the Division report. He then wondered if OCE would welcome similar delays with the St. Lawrence Seaway. "The general got the point immediately," Hatch noted, "and said the regional office had stepped out of line in making any such recommendation." Wheeler promised to rescind the order at once and send the Albuquerque District report back to New Mexico for further work. Hatch doubted that OCE would begin construction prior to the compact, but saw hope in the embarrassed position held by the Corps.[13]

The need for additional water supplies outweighed the differences between New Mexico and Texas, and the presence of two federal agencies willing to build water projects in the Pecos basin prompted the signing of the Pecos River Compact on 3 December 1948. Article I called for "the equitable division and apportionment of the use of the waters of the Pecos river," and also called for "construction of works for (a) the salvage of water, (b) the more efficient use of water, and (c) the protection of life and property from floods." Both states agreed to maintain streamflow delivery at the "1947 condition" [the amount that Texas received that year], and to apportion all new supplies gained through water salvage and conservation at the rate of 43 percent for Texas, and 57 percent for New Mexico. Texas would keep all waters thus saved that originated within its borders, and any unappropriated flood flows would be divided equally between the two states.[14]

The Pecos River Compact allowed the Albuquerque District to escalate the pace of its studies in the Pecos basin and to recommend new facilities. The only major project on District drawing boards at that time was Jemez Canyon Dam, which had met its own opposition and budget cuts at the time of the compact negotiations. The District was eager to maintain its civil works branches in hard times, and the Pecos studies offered an opportunity not readily available on the Rio Grande. By May 1950, the District had held meetings in Carlsbad, New Mexico, and Pecos, Texas, to discuss local flood control work. The Corps also unveiled its plans for Los Esteros Dam and Reservoir north of Santa Rosa, and the transfer of irrigation waters from Alamogordo Reservoir to free that facility for all Pecos flood storage. The District sought local opinion on these projects, and support from interested parties to share in the cost of construction and maintenance.[15]

On 16 January 1951, the District went before the compact commission in Santa Fe to present its case for flood control. The key to the District proposal was the Los Esteros-Alamogordo project. Los Esteros would offer the same circumstances of geology and hydrology as had Abiquiu in the late 1950's. The high cliff walls at the site meant that a 220-foot earthen embankment could be built inexpensively to store 785,000 acre-feet of water, of which 475,000 went for flood control and the rest for irrigation. Alamogordo Reservoir would be drained, and its valves removed, to serve only as a flood protection facility. The District argued that Los Esteros offered lower rates of evaporation, a larger irrigation capacity, and less sedimentation. Should the commission reject the plan, Alamogordo would continue silting up at the annual rate of 2,200 acre-feet. In less than 40 years, then, local water users would have to build a new facility at private expense. Los Esteros, by comparison, would increase the life of Alamogordo Dam to 100 years, in essence paying for itself by removing the need for a newer dam in the future.[16]

At the Santa Fe meeting the Albuquerque District also addressed two other questions on the minds of Pecos water users: local flood protection in several

communities and the presence of water-absorbing plants, known as phreatophytes, in the streambed. The Corps joined a group called the "Salt Cedar Interagency Task Force" to study and develop methods of eliminating these plants in order to recapture an estimated 150,000 acre-feet annually in the Pecos basin. This work had been one of the stipulations of the Pecos River Compact. Suggestions included burning, poisoning, and plowing under the offending plants, which had appeared in the basin after extensive irrigation began at the turn of the century. The heavy cost of destruction and maintenance in succeeding years made this aspect of the overall basin plan more tentative than support for Los Esteros in the north.[17]

Public notice of the District's plans revealed deep divisions over management of Pecos water resource facilities. No one challenged the water salvage program, and a federally funded project at Los Esteros was a gift none could reject. But the matter of storage concerned both the CID and the Texas Commissioner of the Pecos River Compact. R.T. Spence, president of the CID, disliked the drainage of Alamogordo Dam, a structure being paid for by Carlsbad water users. Placing CID waters 60 miles further north increased chances for evaporation and groundwater seepage before the water reached its clients. The CID also felt that salt cedars retarded siltation and should not be removed altogether. Spence suggested a site known as "Carlsbad No. 3," north of that city, which in 1984 would become the location for Reclamation's Brantley Dam. The CID also wanted more channelization of the Pecos than the Albuquerque District thought practicable. Without these stipulations the CID could not support the Los Esteros plan.[18]

Of more concern to the District was the reluctance of Texas to support the Pecos study. J. C. Wilson, Texas commissioner of the Pecos compact, believed that the District had moved too hastily in its work and had ignored several crucial factors. The District had conducted surveys only as far south as Artesia, and overlooked conditions at the state line where deliveries would be measured. Wilson also read the District's report to say that Texas would lose 8,000 acre-feet annually in the process. "The proposal constitutes a step in the right direction," Wilson concluded, but further work stood between the District and the consent of the Texas water commissioner.[19]

In 1951 the concerns of the various parties to the compact led John Bliss, New Mexico State Engineer, to request yet another assessment of the Pecos valley. Bliss contended that the irrigation storage at Alamogordo Reservoir served a more vital purpose than the Albuquerque District understood, and that the Fort Sumner Irrigation District needed winter storage at that facility to retain its share of year-round Pecos waters. Bliss also feared that long and involved court suits might result from the transfer of adjudicated water rights transferred to Los Esteros Reservoir. Finally, the state engineer believed that the District had overlooked Reclamation plans to improve the capacity of Alamogordo Reservoir. This "difference of opinion" would have to be resolved through a complete study of the Pecos, from the Gallinas River to Red Bluff Dam. Until then the State of New Mexico recommended deferral of construction plans at Los Esteros.[20]

For the next five years the Albuquerque District labored on its report to Congress on authorizing flood control facilities for the Rio Pecos. Opposition from Texas and the local irrigators did not relent, while other factors came into play that further clouded the issue. Supporters of recreational opportunities in the Pecos basin wanted the same access to water sports as their more urban



Plate No. 33. Flood Fighting in Northern New Mexico

counterparts on the Rio Grande. Elliott Barker, New Mexico State Game Warden, informed the District that its plans for a recreational pool at Los Esteros were inadequate, and that public opinion would challenge the District to increase the capacity from 6,000 to 15,500 acre-feet for public use. "The time has passed," Barker warned, "when the public interests can be ignored or minimized in the construction of public works of this kind." The game warden cited as support for his argument an idea that the District had been slow to recognize, but that would quickly become a popular issue throughout the Southwest. "The need for good healthful outdoor recreation is very much greater now," said Barker, "due to the strain of high tension living under modern conditions." Conchas Lake, 60 miles east of Los Esteros, served as a reminder of this fact. Where the District in 1945 had planned for 10,000 visitors annually, by 1951 the count had surpassed 80,000. "Let us not . . . underestimate the need for recreation," Barker concluded, "nor the factors that are necessary to provide it."[21]

In spite of the strong opposition in 1956 to particular phases of the Pecos basin study, the Albuquerque District believed that a majority of local residents supported it in principle. The Corps presented a recomendation to U. S. House Speaker Sam Rayburn for facilities at Los Esteros and Artesia, New Mexico, and Pecos, Texas. Work to protect Roswell and Carlsbad had been separated from the overall study and included in other plans submitted to Congress. The basis of the proposal was the combined Los Esteros-Alamogordo project. The District wanted to raise the height of Alamogordo Dam ten and one-half feet, build an emergency spillway, and remove all gates and piers to create an uncontrolled operation. Los Esteros would become the primary storage facility in the upper basin, with a dam 218 feet high and 1,800 feet in length. The new structure would retain 587,000 acre-feet of water, divided into 250,000 for irrigation, 60,000 for sediment, and 277,000 for flood control. This would complement the Two Rivers Reservoir on the Rio Hondo near Roswell, the Dark Canyon Floodway in Carlsbad, and channel and levee work in Artesia, New Mexico, and Pecos, Texas. The District estimated that Los Esteros would cost $7 million dollars; the work at Pecos to be $2 million; Artesia $600,000; and Carlsbad $6.7 million.[22]

The response to the District report reflected the divisions over water use in the Pecos basin. President Eisenhower's Bureau of the Budget wanted more support from local irrigators, and Texas was leery of backing a project opposed by the CID. New Mexico wanted more local flood protection in the upper basin, especially near Las Vegas. The CID felt that other water users would get a free project with Los Esteros, whereas Carlsbad was obligated to pay for all of Alamogordo Reservoir, a facility that would no longer serve the purpose for which it had been built. The Carlsbad irrigators especially disliked such uses for Los Esteros as storage of Santa Rosa's municipal water supply, and recreation. The Interior Department felt snubbed by the Corps' rejection of Reclamation improvements in the basin, and the Federal Power Commission, as usual, wanted a larger pool at Los Esteros to generate electricity at half the cost charged by local utilities. No one seemed happy with the finished product of Albuquerque District planners, guaranteeing still more debate and controversy over the Pecos River.[23]

The anticipated work on the Pecos languished as local irrigators and the New Mexico state engineer disagreed on procedures for transfer of water to Los Esteros Reservoir. The Dark Canyon project in Carlsbad became marginal for the Corps, because its ratio of benefits to costs was 1.04 to 1. The mayor of

Pecos, Texas, informed the District on 13 June 1960, that his community could not raise the $320,000 necessary to purchase rights-of-way and relocate roads and bridges. This placed the Pecos project on inactive status. Only at the Two Rivers Reservoir, a combination of two retention dams west of the city of Roswell, was construction underway within five years of Congressional authorization. By 1960 the Corps had suspended efforts to fund Los Esteros itself, negating a decade of planning and design work by the Albuquerque District.[24]

Under Congressional statute, the Corps had to notify New Mexico that Los Esteros would be deauthorized by 1965 if no agreements on local participation were forthcoming. The State of New Mexico conducted its own surveys of the Pecos, and worked with CID officials to develop a compromise position on Los Esteros water transfers. The approaching deadline moved all parties to action, and on 25 June 1965, CID's Board of Directors adopted a resolution "pledging cooperation with the U.S.A. in flood control work." The CID agreed to meet Albuquerque District conditions, but wanted to keep some irrigation water stored at Alamogordo Reservoir. The irrigation district would thus make available to Los Esteros 260,000 acre-feet of storage capacity.

This announcement pleased the District, but did not resolve the other issues involving Pecos waters. The Fort Sumner Irrigation District had no reservoir facilities of its own and relied upon 100 cubic feet per second drawn directly from the river at all times. Loss of Alamogordo storage not only endangered the availability of irrigation water, but also removed the recreational potential of the reservoir. The Fort Sumner Chamber of Commerce pleaded with the District to leave some storage in a nearby pool, to protect the million-dollar investment in cabins and the tourist trade that the chamber called "vital to the economy of Fort Sumner."[25]

The resolution adopted by the CID soon became more of a headache to the District than had appeared at first glance. The Bureau of Reclamation and the Corps could not reach agreement on their working relationship in the Pecos basin, and the New Mexico state engineer wanted such a settlement before issuing permits for transferral of CID waters to Los Esteros. In 1967 the Bureau agreed to the Corps' plans for Los Esteros, but reserved to itself the flood control management at Alamogordo. Both parties had to wait for the New Mexico state engineer to release the irrigation waters from Alamogordo. Until then the Albuquerque District would ask Congress for additional study money, with $100,000 the request for fiscal year 1968.[26]

The continued reluctance of the CID to meet the Corps' stipulations on Alamogordo storage kept Los Esteros on delayed status for several more years. In order to move negotiations off dead center, Reclamation and the Corps signed a Memorandum of Understanding on 8 September 1971, wherein the Albuquerque District dropped its long-standing demands for modification of Alamogordo Dam. Los Esteros would be reduced to a capacity of 449,000 acre-feet, with 167,000 for flood control. Alamogordo would retain 20,000 acre-feet for irrigation, while Los Esteros received the remaining 200,000 acre-feet.[27]

No sooner had the District reached its compromise with Reclamation over Alamogordo Dam than did the FSID, the other major water user in the basin, file a formal protest against the impending CID water transfer. Fort Sumner farmers contended that between Los Esteros and the proposed Brantley Dam near Carlsbad, water users would experience heavy losses through seepage and evaporation. The FSID wanted Alamogordo to keep a 20,000 acre-foot "last-call pool" to guarantee quality releases at all times. The irrigators also wanted as-

surances that operations at Los Esteros would not endanger channel capacities downstream, and that sediment studies be undertaken periodically to reveal the actual losses, rather than reliance upon Corps estimates.[28]

The Albuquerque District had not anticipated the action of the FSID once the project had received approval from the CID and Reclamation. The Corps noticed that a former employee of the state engineer's office, Dr. Zane Spegal, had encouraged the FSID to reject the 1971 agreement. Bob Billingsley, Public Affairs Officer for the District, informed Senator Joseph Montoya's office that Spegal was "disgruntled," and that his reasons for opposition to Los Esteros were "unknown." The state engineer, however, had cited studies conducted by Spegal in 1957 on the Santa Rosa sandstone formation around Los Esteros. At that time Steve Reynolds had warned Robert Woodson of the District that Los Esteros would cover sandstone cliffs, causing "large leakage [to] occur into the San Andres formation." Spegal claimed to have detected subsidence into limestone caverns in the area that could create sinkholes and affect water quality downstream from the structure.[29]

The evidence gathered by Zane Spegal had been forgotten by the District and the state engineer, but it disturbed FSID irrigators enough to question Corps officials closely at hearings on Alamogordo water transfers, held in Santa Rosa in September 1972. Attorneys for the FSID elicited testimony from District representatives that Los Esteros would draw down Alamogordo Reservoir, with a corresponding reduction in the quality of irrigation water. The CID allied itself with the Corps, and hoped to achieve a "gentleman's agreement" with their competitors on the matter. The CID officials knew of the volatility of water politics, however, and one conceded that "as it gets drier [in the Pecos basin], the less gentlemanly we get."[30]

When State Engineer Steve Reynolds ruled in favor of the Carlsbad irrigators, the District, and the Bureau of Reclamation, the FSID realized that they had no veto power over the future of Los Esteros. In late September 1972, the FSID filed suit in state district court to prevent the transfer of Carlsbad water to Los Esteros. Another small group of water users in the Upper Pecos basin between Las Vegas and Santa Rosa, the San Juan Irrigation District, joined the FSID suit. Corps officials sought an out-of-court settlement with these farmers to continue work on Los Esteros, and achieved an agreement on 13 March 1974. The Corps and Reclamation agreed to redesign the outlet works at Alamogordo Dam to permit the FSID to receive its 100 cubic feet per second of irrigation releases during the summer low-flow season. This paved the way for groundbreaking ceremonies at Los Esteros Dam, where Senator Montoya delivered the major address.[31]

As with other Albuquerque District water projects, Los Esteros Dam and Reservoir encountered a measure of controversy after construction had begun. This included arguments over the existence of tar sands and archeological sites, cost overruns, and the need for a recreational pool. Before the District could announce bids in 1975, the Maja Oil and Mining Company of Albuquerque claimed that it had leased 11,173 acres of land at the Los Esteros site. Maja Oil also declared perfection of a technique to extract bitumen from the sands beneath the proposed reservoir. James L. Young, president of Maja Oil, contended that 500 million barrels of crude oil existed on its leased lands, two-thirds of which the Corps had condemned with no payment to Maja.[32]

The passage of new environmental regulations in the National Environmental Policy Act [NEPA] of 1969 caused the Albuquerque District to wait

until tests confirmed the claims of Young and his company. Maja Oil stated that it used a unique "enzyme process" where diesel fuel was forced down into the rock, releasing a solution that resembled crude oil. Young had filed suit in U. S. District Court in May 1975, to withhold 10,700 acres of the Los Esteros site for production of oil processing. Maja demanded repayment by the Corps of $500 million for their losses, a reduction from the original $2.5 billion claim. In addition, another leaseholder, Jones Wyoming Company, sought from the Corps $500,000 for its surface rights and $60 million more in lost mineral royalties. The tests proved that Maja and Jones Wyoming had greatly overstated their cases, and all claims were thrown out. The delay, however, pushed back construction at the site and increased project costs for legal fees and additional mineral testing.[33]

The tar sands controversy receded as the District stumbled upon another issue of equal complexity. This involved discovery of archeological sites of significant historical magnitude on lands to be inundated by the renamed Santa Rosa Reservoir. Southern Methodist University had received a contract to fulfill a portion of NEPA that required the Corps to file detailed Environmental Impact Statements [EIS] prior to completion of water projects. This resulted in the discovery of 246 archeological sites. The Corps then hired the Center for Anthropological Studies in Albuquerque and its director, Albert Ward, to complete a second phase of the archeological work at Santa Rosa involving the excavation of many significant prehistoric and historic locations.

This work sparked a bitter academic and legal dispute over what was known as "Site 48," a supposed 18th century Spanish and Indian village on the Pecos River. Ward claimed to have found well-preserved remains of community life, and located walls of an old fort to prove his contentions. Other academics appeared to criticize Ward's findings, saying that old Spanish documents made no mention of such a facility. Another contract was awarded to the Office of Contract Archeology, based at the University of New Mexico, for analysis of materials uncovered at Site 48. Recriminations flew from all sides, with Ward threatening lawsuits and critics thinly disguising their consternation with Ward and his techniques. By the summer of 1985 the "Site 48" conflict had not yet been resolved.[34]

All these problems did not keep the dam from completion in the fall of 1979. The $5.7 million requested for Los Esteros in 1956 had grown to the sum of $43 million. The structure stood at 212 feet in height, and reached 1,950 feet across the Pecos River. In 1980 the Corps changed the name to "Santa Rosa Dam," to identify it more closely with the nearby community of the same name. The Bureau of Reclamation cooperated by altering Alamogordo Dam, renamed Fort Sumner Dam and Reservoir in 1980, with an increase of 16 feet in height, and construction of a 206,000 cfs spillway. The Carlsbad Irrigation District kept 20,000 acre-feet of water at Fort Sumner Dam, and held the remainder in Santa Rosa for summer release and winter storage. The Albuquerque District also added recreational facilities around the dam in the summer of 1980.[35]

With the storage of water behind Santa Rosa Dam, local civic and political leaders looked to creation of a permanent pool to attract visitors and strengthen local businesses. When the Albuquerque District closed the gates of the dam in November 1979, the tourist town of Santa Rosa along Interstate 40 had experienced six months of hard times related to the 1979 Arab oil embargo. With an economy heavily dependent upon automobile traffic, Santa Rosa needed the lure of a desert lake to attract the dwindling number of travelers passing through

town. Making matters worse was the oppressive heat of the summer of 1980, when the city of Albuquerque experienced 28 consecutive days of 100-degree-plus temperatures. The CID called for every drop of irrigation storage that season, and the one-half inch rainfall that fell in July left Santa Rosa boosters with the embarrassment of a $43 million dry lake bed. The CID had wanted the reservoir drained two weeks before the dedication of the dam, and the town had to plead with the irrigators to leave the water until Governor Bruce King, U. S. Representative Manuel Lujan, and other dignitaries could praise the potential of the reservoir in a formal public ceremony.[36]

The completion of Santa Rosa Dam brought to an end the construction work of the Albuquerque District in the Pecos River basin. Pecos, Texas, and Artesia, New Mexico, had failed to provide the necessary local cooperative agreements for Corps work, and had their projects deauthorized. The District warned Carlsbad that continued development in the Pecos flood plain would make protection exorbitantly expensive, but the city offered these lands to businesses and homeowners in disregard of warnings that Avalon and McMillan Dams could not hold back standard-project floods. Carlsbad turned to the Bureau of Reclamation for help instead, which agreed to construct Brantley Dam above the city for irrigation and flood control. The Albuquerque District had tested the site, and core samples showed the danger of seepage because of the presence of soluble subsurface layers. Also, the problems from a high rate of evaporation and sedimentation are extreme. The Bureau of Reclamation had conducted numerous studies in the area, and New Mexico political officials convinced Congress to authorize $240 million for Brantley Dam in 1984, providing a reservoir to Carlsbad and employment to an area of the state reeling from heavy reductions in potash mining.[37]

In many ways the work of the District on the Pecos could not compare to the Rio Grande, but in the case of flood protection for Las Vegas, New Mexico, the Corps encountered perhaps its most biting criticism in the days of heightened environmental awareness. Ever since Hub Kane of the *Las Vegas Optic* had asked OCE for help in 1945, local leaders sought flood control for the Gallinas River that flowed through the town on its journey to the Pecos. Floods in 1957 washed out four small check dams above Las Vegas, along with roads and bridges. Even though the town suffered $50,000 in damage, the District felt that the dams did not constitute proper flood protection, and that the cost of removing the existing families along the Pecos Arroyo would be prohibitive. Thus the District could not extend its services to the residents of Las Vegas.[38]

The town experienced no further damage until 5 August 1971, when a summer thunderstorm threatened the National Street bridge and other thoroughfares. The channel capacity of the Gallinas River had deteriorated, with sediment reducing the clearance at Bridge Street to just four feet. Las Vegas asked the Albuquerque District to study the problem, and the Corps' suggestions appeared in February 1972. By this time environmental concerns had become an important question in overall Corps planning. Often local groups critized the operations of Districts like Albuquerque, some with better intentions and results than others. Dave Foreman, editor of the University of New Mexico student paper, *The Daily Lobo,* wrote an exceptionally pointed editorial about the Las Vegas plans. He noted that the level of Corps protection exceeded the U. S. Geological Survey records of the largest Gallinas flooding by eight times. Foreman revealed a concern many people expressed about costly engineering features, but did so with language that detracted from his larger message.[39]

Flood protection in the Pecos basin never reached the dollar amounts, nor the reservoir size, of the larger Rio Grande projects. But a combination of geologic, environmental, political and economic forces made Albuquerque District work on the Pecos at times as challenging as anything on the Rio Grande. There were no advocates for the Pecos River like central New Mexico had in Dennis Chavez, Clinton Anderson or Joseph Montoya, nor were the urban centers of eastern New Mexico large enough to command the necessary federal expenditures. But for residents of the Pecos basin the threats of flooding, the need for irrigation and municipal water supplies, and the desire for leisure time facilities at reservoirs echoed the demands of Albuquerqueans and Santa Feans. The presence of the Albuquerque District of the Army Corps of Engineers provided the region with much needed technical and financial support, even where it seemed that competing water interests would destroy whatever compromises could be achieved.

XI

LOCAL FLOOD PROTECTION IN THE ARKANSAS RIVER BASIN

The complexity and challenge of working in the Rio Grande and Pecos basins in New Mexico and Texas kept the Albuquerque District busy in the years after 1945. Problems of local flood protection in these regions became hampered by different water laws, uses, and governmental organizations assigned to their management. A third area of concern for the District, with its own challenges, was Colorado. Here the Albuquerque District had constructed John Martin Dam, the largest storage facility in the upper Arkansas River basin. The Corps would also be called upon for flood protection on the Rio Grande from its source in the San Juan mountains to the New Mexico state line, and the entire Arkansas valley into central Kansas. Included would be works at Creede on the Rio Grande, Platoro on the Rio Conejos, levee and channelization for Colorado Springs, Pueblo, Las Animas, Holly, and Granada, and a storage reservoir above the southern Colorado community of Trinidad.

The first studies conducted by the present-day Albuquerque District in Colorado waters stemmed from its authority at John Martin Dam. The same Flood Control Act of 1936 that called for construction of Caddoa Dam also requested studies of Arkansas river tributaries west of the proposed site. These studies involved the major streams contributing to flood flows in the Arkansas, rising in the Sangre de Cristo mountains west of Pueblo and Trinidad. Included were the Purgatoire, which the locals pronounced as either the Purgatory or "Picket Wire" river, the Apishapa, Cuchara and Huerfano rivers. The District also studied the stream flowing south through Colorado Springs known by early French fur trappers as the Fontaine Que Bouille ["the fountain that boils"], renamed "Fountain Creek" for ease of pronunciation.[1]

While the then-Caddoa District looked at flood potential in southeastern Colorado, the Chief of Engineers ordered the Galveston District to fulfill the requirements of the 1938 Flood Control Act to study the Rio Grande above the New Mexico state line. This District had authority in the Texas and New Mexico reaches of the Rio Grande prior to 1942, when its surveys were given to the Albuquerque District. The report called for two separate water projects in southern Colorado to protect local communities from floods, as well as to improve irrigation and Rio Grande Compact deliveries owed downstream by Colorado. Wagon Wheel Gap Reservoir, to be located 32 miles north of the town of Del Norte, would store one million acre-feet of water. Of this 60,000 acre-feet was for flood control, 50,000 for recreation, and the remaining 890,000 acre-feet would supply farmers in the San Luis Valley with water. This facility would also triple the capacity of irrigation storage in the area.

Joining the Wagon Wheel Gap reservoir would be either two small reservoirs or one larger pool at Platoro, on the Rio Conejos. The Platoro site would hold 100,000 acre-feet, divided equally between flood control and irrigation. Wagon Wheel Gap would cost $13.7 million, and Platoro $2.5 million. The Corps

supported its requests for such large facilities in a drainage area populated with less than 40,000 people by noting the plans of western politicians to construct transmountain diversions in southern Colorado. Wagon Wheel Gap reservoir would need space to handle the volume of water that would come from an interbasin transfer. Wartime conditions mitigated against work at either site, and by 1950 the Albuquerque District had completed local protection works only in Creede.[2]

As World War II neared its end, the Albuquerque District project at John Martin Dam led Congress to authorize studies of other communities in the Arkansas valley. The Flood Control Act of 1944 called upon the District to provide levee and channel work on the Templeton Gap Floodway, a section of Monument Creek that flowed through Colorado Springs to Fountain Creek. The city had to contribute $242,000 of the total $1.08 million cost, but became concerned when portions of the 11,500-foot-long channel collapsed into several abandoned mine shafts. Since one stipulation of the agreement with the Corps absolved the Albuquerque District of any responsibility for finished work, the city was reluctant to assume maintenance for a flawed project. The District then agreed to repair the channel at no expense to Colorado Springs. Then in 1956 the city provided its matching funds and took control of the Templeton Gap Floodway.[3]

The next location in the Arkansas basin to attract the attention of the District was Pueblo, Colorado. The destructive flooding of June 1921 that killed 78 people had been one of the main factors in the authorization of John Martin Dam downstream, but no work had been done in the city of Pueblo itself. After this flood the town created the Pueblo Conservancy District [PCD]. It constructed levees, channels, and Barrier Dam six and one-half miles west of the city. When first built in 1925, the structure could detain 125,000 cfs of flood waters. But silt-laden runoff had reduced Barrier Dam's capacity by 90 percent in 1949, and the city leaders feared another disaster should the 103,000 cfs flow of 1921 ever recur.[4]

The District's report in 1949 prompted Congress to allocate $217,500 to alleviate the most severe problems at Pueblo. Colorado politicans informed their colleagues in the U.S. House of Representatives that Pueblo had undergone an economic transformation after 1940 similar to Albuquerque. The Korean War put most small flood protection projects on hold, but Senator Eugene D. Millikin cited statistics to prove Pueblo's role in America's war effort. Of the 85,000 residents, 6,500 worked at the Pueblo Ordnance Depot, while 8,000 more were employed by the huge Colorado Fuel and Iron plant. The 1921 flood had hindered the growth of Pueblo when the economy consisted only of agriculture and livestock. Another catastrophe would cost far more than the $10 million in damages of the previous event. In November 1952, the District concluded work on the backwater channel of the Arkansas, and warned local officials to limit any further growth in areas susceptible to flooding near the railroad yards and the steel mills.[5]

The Albuquerque District had no more responsibilities on the Arkansas River until passage of the 1962 Flood Control Act. That legislation ordered the District to undertake studies of local protective works for Dodge City, Kansas. The former cattle town and home of legendary gunfighters had seen modest postwar growth in the floodplain below the old downtown area. Local officials had constructed levees that protected the town from 10,000 cfs flood flows, but these proved inadequate once John Martin Dam began controlled releases in 1949. The District hoped to erect levees and channels sufficient to carry 40,000

cfs through town safely. This amount was double the volume of water that had flooded Dodge City in 1951.[6]

Those who proposed the work at Dodge City encountered complications that would afflict all communities facing flood control needs in the western Arkansas valley. Dodge City relied upon agriculture for its economic strength, as the stockyards had become less significant after World War II. The Albuquerque District wanted the town to pass zoning restrictions to keep development out of low-lying areas. The city would also be charged with pumping out excess floodwater, as well as operations and maintenance of the levee system. These costs amounted to $320,000 in 1964, with $5,200 needed annually thereafter. The only source of funds available were municipal bonds, and voters rejected the city's appeal in April 1964. The Albuquerque District had no choice but to deactivate the project and rely upon city officials to resubmit the bond question at a later time.[7]

The matter of Dodge City flood control received much attention from city residents the following summer when the great 1965 flood on the Arkansas carried 82,000 cfs through town. Hundreds of tons of silt were deposited on farmers' fields, and downtown Dodge City became saturated with nearly five feet of floodwater. Many cattle being prepared for market were swept away, and roads, bridges, and utilities were destroyed. The Albuquerque District established a temporary field office in Dodge City, and President Lyndon Johnson declared western Kansas a disaster area.

The need for immediate relief clarified the issue of flood control in the voters' minds. When city officials offered another bond election on 12 October 1965, Dodge City approved it overwhelmingly. The town indebted itself for $700,000 to match the District's costs of $3 million. The 1965 flood led the District to recommend levees capable of holding back 60,000 cfs, since the 1965 volume of 82,000 cfs was considered likely only once every 250 years. The flood also delayed construction plans as well.[8]

Although voter response to the District's request had been swift, meeting the stipulations of land purchases and zoning regulations further hindered completion of the Dodge City project. It took nearly five years for the city to deliver its formal assurances of cooperation to the District. The city also had to comply with the environmental clauses in the 1970 Flood Control Act and the Uniform Relocations Assistance Act. The city executed an agreement with the District to meet these requirements in May 1973, by which time Dodge City's costs had risen to $92,000. The town did not acquire all necessary rights-of-way until late 1975, when the District opened contract bids for the construction work. The final touches were completed in April 1977, 25 years after authorization and nearly a dozen years since the devastation of 1965.[9]

The delays in construction of Dodge City's flood protection paled in comparison to the experience of its neighbor: Great Bend, Kansas. The easternmost location of the Albuquerque District, Great Bend not only bore the brunt of Arkansas River flows; it also had Walnut Creek enter the valley within its city limits. The Flood Control Act of 1965 recommended protection on a scale equal to Dodge City and sought similar proscriptions against flood plain development. The case of Great Bend differed markedly, however, as the District had double the amount of protection to provide. When city officials called upon Great Bend voters on 10 August 1965, to approve tax assessments to meet a non-Federal cost of $1.9 million, the populace rejected the appeal despite fresh memories of flooding downtown less than 60 days earlier.[10]

The Great Bend experience with flood protection only worsened as inflation from the Vietnam war years drove the costs of the project higher. A second bond election on 2 April 1968, was fruitless, leaving the project on an inactive status with District planners. When voters finally returned to the polls on 2 November 1976, the local share had increased 230 percent to $4.5 million: an amount equal to the original total estimate of 1966. The U.S. government had not escaped the Great Bend price spiral, either, seeing its costs increase some 400 percent to $18.6 million. Environmental impact statements and doubling the size of the Walnut Creek channel to accommodate 46,000 cfs were partially to blame. Local property owners, however, could not bear the burden of taxes, and turned the bond issue down in November 1976 and again on 24 May 1977. The District deactivated the Great Bend project two weeks later, and on 10 June 1977, the city council officially notified the Corps of its inability to pay. The District then removed Great Bend from its list of studies, and when OCE realigned the District in 1982, the Tulsa District took over what remained of the Great Bend authorization.[11]

The loss of military construction work and the Nixon budget reductions curtailed much of the District's activity on the Arkansas River until 1974. The only project on active status had been flood control levees for Las Animas, Colorado, where the Purgatoire River enters the Arkansas. Authorized as part of the 1965 Flood Control Act, delays similar to Dodge City and Great Bend kept the Las Animas work from completion until 1978. As other District projects in the Rio Grande and Pecos River basins were either concluded or terminated, the District stood in danger of losing even more staff and responsibility as the reductions of 1970 hit home.[12]

The situation facing the Albuquerque District affected many other federal water agencies nationwide in the mid-1970s. Rising environmental consciousness saw western water projects as unnecessary or destructive of their natural surroundings. The confusion of the Watergate years and the continuing budget crises brought most planning for new water projects to a halt. The pent-up demand for flood protection could not be checked, however, as Congress passed the Water Resources Development Act of 1974. Public Law 93-251 included a host of studies and authorizations for the District on the Arkansas River, from Leadville in the Rockies to Holly near the Kansas state line. Towns affected were La Junta, Florence, Portland, Brewster, and Pueblo, and the entire stretch of 76 miles between Pueblo and Las Animas.

Of the many projects suggested in the 1974 act, the two most ambitious were the "Arkansas River Channelization Test Reach," and Fountain Lake Dam. The former was a seven-mile experimental project west of La Junta. The Albuquerque District would build an outdoor scientific laboratory to study water salvage, fish and wildlife management, and preservation of the "unique environmental elements affected by the channelization." The District would encourage representatives of state and local government, environmental groups, and interested citizens to observe the operations at La Junta, and would use its findings in future projects in the arid region of the Southwest. The Corps sought local cooperation for maintenance of the facilities to be constructed, and asked Colorado residents for $2.8 million to match the federal expense of $4.3 million.[13]

The test site at La Junta represented the future of the District in an age of environmental and economic strictures. But the construction of large-scale water projects had been the center of Albuquerque District history for four decades. The District then agreed to study the feasibility of Fountain Lake Dam,

on the north side of Pueblo. Colorado water interests had gained authorization of the $169 million Frying Pan-Arkansas diversion project in 1962, and needed storage reservoirs for the hundreds of thousands of acre-feet to be supplied to Front Range irrigators, industries and municipalities. Fountain Lake, later named Pueblo Dam and Reservoir, would become part of this network of storage pools, even though the diversion project was the work of the Bureau of Reclamation.

When the Albuquerque District planners first conceived of Fountain Lake, they envisioned an earthfill dam over two miles long and 172 feet high. The reservoir could hold 247,000 acre-feet, of which 187,000 went to flood control, 40,000 for sediment, and 20,000 acre-feet constituted a recreational pool. Local interests would provide the latter amount of water, manage all recreational facilities, restrict development in the Fountain Creek channel below the dam, and assume all liabilities for construction and maintenance. The District estimated that Pueblo Dam would cost the federal government $53.6 million, and local cooperation would amount to $1.3 million.[14]

The relatively low cost of Pueblo Dam, like many other aspects of the 1974 Water Resources Development Act, proved too good to be true. All over the West similar plans encountered stiff opposition from environmentalists. When the Bureau of Reclamation's large earthfill Teton Dam in southern Idaho gave way in 1976, demands for cessation of similar work reached all the way to Washington. The new President, Jimmy Carter, began his term in 1977 by announcing a so-called "hit list" of western water projects that he promised to veto. Pueblo Dam was not among them, but the resultant publicity, and the increase in costs to $73 million in 1978, endangered the Colorado facility in Congress. The elaborate plans of the Arkansas basin quietly faded from the annual reports of the Albuquerque District, awaiting more propitious times in the 1980s.[15]

What made deletion of the comprehensive Arkansas basin study report so distressing to the Albuqueque District was the completion in 1977 of the last major Corps water project in southern Colorado, Trinidad Dam and Reservoir. The structure had the distinction of being the most drawn-out project ever undertaken by the District, and one which the Corps could not justify economically for decades. Trinidad Dam nonetheless symbolized all the legal, political, and economic obstacles the Albuquerque District had to overcome in its work in the Southwest.

The community of Trinidad, Colorado, had witnessed several floods of destructive proportions since its origins in the 1860s. The Purgatoire River rises in the Sangre de Cristo Mountains west of the city at an elevation exceeding 14,000 feet. In less than 40 miles the river descends nearly 8,000 feet in altitude and enters a narrow canyon where the citizens of Trinidad and other villages occupy the valley floor. The major activity in the area was coal mining, with Colorado Fuel and Iron of Pueblo a major purchaser of Trinidad coal and coke. The region achieved some unwanted publicity in 1913 when miners in the neighboring town of Ludlow staged a long and bitter strike against John D. Rockefeller's coal company. Squads of hired gunmen were sent to break the strike, and the resultant violence took the lives of many men, women and children. The bodies of the victims of the "Ludlow Massacre" were brought to Trinidad for autopsies, which revealed that over two dozen of the women and children had died of asphyxiation when trapped in the root cellars of their burning tent village.[16]

The precarious location of Trinidad left it vulnerable to flood flows in 1866, 1883, and 1886. At that time the community numbered only a few hundred

souls, and damage was hard to assess. But in 1904 heavy rains all along the Sangre de Cristo range created flood hazards, and on 30 September a wall of water carrying 45,400 cfs washed out most of the town. Local newspaper accounts pegged the damages at $500,000. Trinidad could not afford extensive flood control measures, and subsequent floods in 1921 and 1925 disrupted community life once again.

After each disaster city officials debated the proper method of securing local protection. It was not until the federal government passed legislation during the Depression to study such questions that Trinidad had hopes of achieving a solution. In 1935 J. C. Caldwell, secretary of the Trinidad-Las Animas County Chamber of Commerce, learned of the Arkansas basin study undertaken by the Little Rock District of the Corps. He invited the District Engineer, Colonel Eugene Reybold, to a meeting of interested citizens, primarily representatives of the local ditch companies. Reybold spoke of the plans for Caddoa Dam west of Lamar, and encouraged local interests to participate in Corps studies for a dam at Trinidad. In attendance that evening was John A. Martin of Pueblo, the Democratic congressman from the Third District who was then fighting for Caddoa Dam in Washington. Caldwell and other citizens asked Martin to secure identical support for Trinidad to alleviate both the flood threat and the high rate of unemployement in the coalfields.[17]

The work of John Martin resulted in inclusion of Trinidad in the landmark 1936 Flood Control Act. The Little Rock District came to southern Colorado to conduct its survey, and held a public meeting in Trinidad on 8 September 1937. At that meeting were representatives of Reclamation, the Soil Conservation Service, Colorado Fuel and Iron, and the four railroads with lines running through the city: the Santa Fe, the Colorado and Southern, the Denver and Rio Grande Western, and the Missouri Pacific. Little Rock officials heard testimony in support of a dam above town, and informed OCE of community interest. The Corps undertook a comprehensive survey in February 1938, and on 28 June of that year Congress gave Little Rock money to investigate a site for a dam and reservoir in Long's Canyon, near the mining town of Sopris. The Corps then combined the two studies, and gave them to the Caddoa District in August 1938.[18]

For the next two years Caddoa officials conducted surveys and tests of both sites. They found that a floodway through Trinidad would cost $1.4 million. It would safely carry 68,000 cfs through town, over 50 percent more than the 1904 flood. The floodway, however, would protect against only $14,000 worth of property loss on an annual basis, while maintenance costs would be $60,000 per year. Thus the benefit ration of 0.23 to 1 made the floodway totally infeasible.

The Sopris Dam and Reservoir was only slightly more cost-efficient in the judgement of the Caddoa District. The dam would cost $3.9 million, of which local users would have to pay $1.9 million. In addition to the heavy indebtedness this would cause the city, the District estimated nearly $200,000 for annual maintenance and operations, with local contributions of $97,300. Even if Sopris Reservoir held irrigation storage, a cost that the Corps did not normally consider, the project benefit ratio would still be only 0.41 to 1. The Caddoa District decided to reject both plans for Trinidad, and suggested local alternatives to federal construction.[19]

Trinidad and Colorado water officials responded with dismay to the 1940 Caddoa report. The Chief Engineer of the Colorado Water Conservation Board believed that the District was too expensive for local interests. The District Engineer for Caddoa, said C. L. Patterson, "followed the usual War Department

practices of designing facilities with large capacities and factors of safety." Patterson wanted a smaller structure at lower cost, which he knew the Corps would not support. The Bureau of Reclamation had conducted studies of its own in 1939, and had suggested a less expensive alternative that focused more on irrigation storage than flood control. Yet even Reclamation had found Sopris Dam uneconomical. Patterson believed, however, that the Bureau would prove more amenable than the Caddoa District, given Reclamation's reliance upon western political support for its work. Trinidad should negotiate behind the scenes with the Bureau, Patterson advised, and hope that something resembling flood control would result.[20]

The earlier objections of the Bureau of Reclamation to the Sopris site disappeared as local water users persisted with their requests for reconsideration. Several conversations with the new Third District Congressman, Republican J. Edgar Chenoweth, led the Bureau to recommend two options for Trinidad. One was a high dam that retained water on a permanent basis, while the other called for a lower detention dam that would decrease flood flows and allow diversion at slow rates for irrigation. The Albuquerque District had assumed study of the Arkansas basin in 1942 and suspected that Reclamation had altered its figures on water values behind the proposed dams to gain local support.

Lieutenant Colonel Reuben E. Cole, Albuquerque District Engineer, informed Rep. Chenoweth that Reclamation's maneuver endangered future plans for the Purgatoire River. "The situation now existing," Cole warned, "is quite embarrassing." The citizens of Trinidad "have been led to believe not by us, but by the Bureau of Reclamation, that storage above Trinidad is feasible." The numbers that the Bureau supplied the District in November 1942, did not square with those of January 1946. "It appears that we are much worse off now than when I last saw you," Cole told Chenoweth, "and that the report will be further delayed through, I think, no fault of ours."[21]

The Albuquerque District concluded its work under the Flood Control Act of 1944, and filed its report in June 1947. In the meantime the House Flood Control Committee adopted a resolution on 20 March 1945, specifically requesting feasibility studies of reservoirs above Trinidad. The District had considered only channelization through town, because that was all Congress had asked in 1944. The District did find one site, Piedmont Bridge Reservoir, that had some favorable economic features. A dam there would be four miles upstream from Trinidad, of 160 feet in height and 13,000 feet along the crest. The storage capacity would be 81,500 acre-feet: 27,500 for flood control and 54,000 for sediment and irrigation. The cost of maintenance, land purchases, and relocation of utilities and homes, however, made Piedmont Bridge no more acceptable than Sopris. The District reiterated its preference for channel improvement only, and requested $909,000 in federal funds and $126,000 from local interests to begin the work.[22]

Because Trinidad water users favored the high dam above town for a multipurpose reservoir, the District made no efforts to push the channelization through Congress. Then in 1949 Colorado and Kansas signed the Arkansas River Compact to distribute the streamflow of the basin between the two states. Article IV-D stated that the compact "was not intended to impede or prevent future beneficial development . . . by Federal or State agencies." This induced Reclamation to press for additional storage of irrigation waters throughout the basin, and eventually led the Corps to reevaluate its plans for a large reservoir

at Trinidad.[23]

Despite the reversal of form by the Albuquerque District on the Purgatoire project, the burden of financial responsibility appeared once more to stall progress on the facility. In July 1954, OCE asked the Bureau of the Budget to disregard the channel improvement project, because the cost had escalated to $2.5 million. In its place the Corps recommended a multipurpose reservoir costing $17 million. The Albuquerque District had worked out a complicated formula for justifying its work. Local interests had to put forth 4.5 percent of the original cost in a cash payment, estimated in 1954 at $372,000. Trinidad would also maintain the Purgatoire channel below the dam through town, and form a conservancy district to pay for maintenance and operation, an amount in excess of $14,000 annually.

The unique feature of the Trinidad dam proposal was the Corps' venture into irrigation payment schedules. The conservancy district would repay without interest the $8.7 million share of the project targeted for irrigation storage. Instead of charging a fixed annual sum for this, as did the Bureau of Reclamation, and linking it to the standard 40-year repayment cycle, the Corps offered irrigators a sliding scale calculated on the basis of availability of water, farm price levels, and annual crop yields. Given this formula, the Corps needed 75 years to recoup its original investment in irrigation at Trinidad dam.

When the Budget office received notice of this arrangement, it conducted its own financial investigation. Several inconsistencies surfaced to threaten support from the Eisenhower administration. Only four and one-half percent of the local flood control costs would be shared by local interests, even though 49 percent of the project went for that capability. Reclamation wanted to operate the structure because of the complexity of irrigation requirements, but the Albuquerque District, despite its lack of experience in the field, demanded full control of Trinidad Dam. The Governor of Kansas feared that a new facility would deplete available streamflow at the state line, a possible violation of the Arkansas compact. When two of the three Colorado members of the compact commission joined Kansas in opposition to Trinidad Dam, the Budget office held that the 1.07 to 1 benefit ratio was too slight to outweigh the costs. The Eisenhower administration considered the project "not in accord with the program of the President at this time," and offered no help with preliminary funding.[24]

The plans of the Corps, Reclamation and local water users appeared hopeless in the summer of 1954. Rising costs and Presidential dislike of expensive water projects threatened to bury Trinidad Dam, permanently. But natural phenomena occurred that assisted the District planners in convincing Congress of the merits of the case. On 18 May 1955, ten inches of rainfall over a heavy snowpack released the largest runoff since 1904 into the streets of Trinidad. When the floodwaters subsided, the Purgatoire valley had suffered nearly $1.9 million in damages, with 60 percent occurring inside the city limits of Trinidad.[25]

The 1955 flood washed out what remained of locally provided flood protection levees, and Chenoweth asked for emergency relief for his hometown. The city estimated that six levee sections were in need of repair, at a cost of $230,000. The Santa Fe Railway suffered $100,000 in damaged track, and the Colorado Highway Department had to replace $75,000 worth of roads. These figures gave Chenoweth the impetus he needed for renewed authorization of Trinidad flood protection. But Kansas political officials, untouched by the Purgatoire runoff, rejected any approval by the Arkansas compact commission for

fear of losing water rights. Colorado did not understand Kansas' objections, and once again the Albuquerque District had no choice but to withdraw its recommendations for Trinidad dam.[26]

Despite this latest in a series of setbacks, Chenoweth and the Trinidad dam supporters kept up the pressure on Congress to fund the project. In the 1958 Flood Control Act they managed to delete reference to the orignial District plan of channel improvements and insert provisions for a multi-purpose reservoir. This structure would be 208 feet high, and 5,930 feet in length. The reservoir would retain 140,700 acre-feet, divided into 39,000 for sediment, 55,000 for irrigation, and 46,700 for flood control. The estimated federal cost was $11.3 million for construction, and $9.7 million for lands and damages. The Corps told Trinidad that it would have to form an organization to meet the requirements of local cooperation. City officials appealed to the state to charter the Purgatoire Water Conservancy District [PRWCD]. On 2 December 1960, the District Court of Las Animas County, Colorado, authorized that body to enter into negotiations with the Albuquerque District.[27]

The principal concerns of the PRWCD in the early 1960s were the transfer of water rights to Trinidad Reservoir, the cost of cooperation with the Corps, and the opposition of Kansas to the plan for releases of Trinidad waters. Each of these problems would delay initial construction until 1968, and completion of the project until 1977. By that time the Army Engineers had devoted four decades to planning and implementation, and one District employee, James L. Redmond, had spent part of his time on the project for a quarter-century.[28]

The debate over water rights transfers began as soon as the PRWCD achieved legal status. Some 19,500 acres of land downstream in the Sunflower valley utilized the flow of the Purgatoire, and several ditch companies had to be included in any contract with Reclamation for storage at Trinidad to succeed. In addition, Colorado Fuel and Iron retained several thousand acre-feet in Jansen Reservoir, and the Model Irrigation District [MID] also had its own storage pool. The MID had 20,000 acre-feet of water to use every year, but siltation had reduced the capacity of its private reservoir to 6,000 acre-feet. Other irrigation structures were similarly defective, and the regularity of flooding made many diversions and headgates inoperable from year to year. A better system of releases would halt this deterioriation, save local farmers money, and guarantee more accurate delivery schedules to downstream users, including Kansas.

The sticking point for the PRWCD was the cost of irrigation storage behind Trinidad Dam. The Albuquerque District ruled out construction of hydroelectric facilities at the dam, due to the irregular levels of storage anticipated. One of Reclamation's selling points to farmers had been the subsidy provided by its hydopower projects, enabling irrigators to meet repayment costs with electricity sales either to themselves to to western urban communities. Trinidad Dam had no such inducement, and thus the entire $8 million storage cost had to be borne by local users. When added to the yearly maintaince cost, the farmers' own expenses for cultivation of their fields, and the marginal nature of agriculture on the high plains of southeastern Colorado, it was not surprising that several ditch companies were not overwhelmed at the thought of leaving their water in Trinidad Reservoir.[29]

While District negotiators worked with irrigators to resolve doubts over storage at the project, the Real Estate Branch faced problems of soaring costs and reluctant land tenants. The area upstream from the damsite had been populated for several decades. Four small mining towns and three cemeteries had

to be relocated. The Albuquerque District paid $881 per acre for these lands, and the costs of removal of families. Six miles of Colorado Highway 12 had to shifted, along with six additional miles of county roads. Nine miles of Colorado and Wyoming trackage were rerouted, as were many utility lines. Jansen Reservoir had to be drained and bulldozed, and its water rights moved downstream to the new facility. When completed, the bill for all lands and damages totalled $9.8 million, 80 percent of which went for purchases of property.[30]

Even though the Albuquerque District stood ready with all manner of technical and financial assistance, the water users of the Trinidad area still faced the requirement of paying a lump sum of 4.5 percent for construction costs. District personnel believed that this figure represented a fair contribution to the local protection features of the dam, and constituted standard operating procedure for the Corps. By comparison, Great Bend, Kansas, owed the District more than ten times the Trinidad amount for work in that community. But as early as 1958 Chenoweth had voiced concern over his constituents' ability to pay the $400,000 that year, retire the irrigation debt, and maintain the facility. Chenoweth and other leaders mounted a campaign to alter the already-generous terms of the 1958 Flood Control Act, again delaying construction at Trinidad Dam.[31]

The economic features of the dam had always bothered Congressional officials studying its merits. In 1963 Senator Allan Ellender, chairman of a Senate Public Works subcommittee, interrogated representatives from OCE about the local participation clauses of Trinidad Dam. The chairman wondered how the community would shoulder the burden of non-federal costs. Trinidad's vagueness about its method of cooperation disturbed Ellender, even though city fathers promised in writing to submit a bond issue to the voters, and would assess a one-mill levy were the issue defeated. But in testimony before Ellender's committee, the Corps informed the senator that Trinidad now hoped to use profits from municipal utility sales, as well as cash reserves, to avoid a bond election. "They are lucky," Ellender remarked about Trinidad's change of plans.

The details of the Trinidad project intrigued the chairman, who then pressed the Corps on the unusual irrigation arrangements. He could not understand why no ditch companies had participated by 1963, despite the low rates asked by the Albuquerque District. Ellender especially inquired about justification for the 75-year repayment schedule. "When was that changed?" the chairman asked. "It used to be forty years." When the Corps could not answer, the Louisiana Democrat became highly upset. "We made them a present of that, payable over 75 years without interest," he remarked caustically. "That is bad enough when you give it to them without interest for 40 years." The chairman then concluded with a stinging rebuke of both the Corps and the Bureau of Reclamation irrigation policies: "To increase the period [of payment] from 40 to 75 years, I think, is unconscionable. I don't know how that happened."[32]

The comments of Senator Ellender touched the weakest point of the Trinidad argument. The town and its neighboring water users wanted and needed flood protection, but economic circumstances prevented them from either doing it themselves or working in conjunction with the Corps of Engineers. Chenoweth had testified before the House Public Works Committee in 1963 on the financial problems facing his community, and how a lack of flood protection trapped Trinidad in a vicious cycle. Chenoweth and Dr. James E. Donnelly, former mayor of Trinidad and then state senator from Colorado, presented the town's situation and the promise that Trinidad dam would bring if it were

funded.

In 1961 the city had an unemployment rate of 16 percent and a decline of 90 percent in the region's coal production. Donnelly, who also served as president of the PRWCD, outlined the grim facts that unemployment and vulnerability to floods created. Insurance companies would not underwrite policies, and corporations refused to invest their money where they had no guarantee against natural disasters. The destruction of the irrigation ditches left farmers unable to contribute to the economic vitality of the region, and the occurrence of dry seasons without a major storage reservoir doomed many landowners to failure.

With the construction of Trinidad Dam, Donnelly contended, the area could lift itself from its economic misery and become self-sufficient. A recreational pool would attract tourists to the natural beauty of southern Colorado, creating an annual multiplier effect in the local economy of several million dollars. In the short term, the spending of federal money would employ hundreds of laid-off miners and other workers. Las Animas county and its largest community had been accepted into the federal Area Redevelopment Program, as well as the Public Works Acceleration Act. Donnelly and Chenoweth, who considered themselves fiscal conservatives, had convinced each other that a temporary infusion of federal funds would generate permanent prosperity as wages, salaries, and taxes percolated through the local economy. "Such expenditures will become [the] foundation upon which revitalization and rehabilitiation . . . can be built," Donnelly testified, and "delay now may impair the long range benefits."[33]

Because Trinidad needed extraordinary help from the federal government, local interests went to work to remove the cash payment feature from the Trinidad Dam requirements. In much the same manner that Clinton P. Anderson acquired recreational waters free of charge for Cochiti Reservoir, Chenoweth sought legislation to change long-standing Corps policy in the local protection of Trinidad. Chenoweth noted that water projects authorized by the 1958 and 1960 Flood Control Acts had escaped the cash contribution clause by means of new language in the 1962 Flood Control measure. The President and the Secretary of the Army now had the discretion to remove the local stipulation if no individual or group received "windfall benefits" from federally sponsored flood protection. Chenoweth also knew that in the White House sat a President, Lyndon B. Johnson, who had vigorously pursued public works projects for his home state of Texas while a member of Congress. Now that Johnson envisioned a nationwide "War on Poverty" to eradicate the economic ills plaguing communities such as Trinidad, Chenoweth felt that the time was right for his bill, House Resolution 5100.

The Secretary of the Army reviewed the requirements for Trinidad Dam in light of the new political realities in Washington, and on 21 May 1964, informed Chenoweth that the Corps would not oppose his legislation. The Secretary went further, however, stating that Trinidad's 4.5 percent share of flood control costs had now ballooned to $548,000, which the city could hardly finance in light of its economic status. Congress did not act on HR 5100, and the defeat of Chenoweth in the Democratic electoral landslide in November 1964 removed Trinidad's champion from Washington. But his successor, Frank E. Evans, a Democrat from Pueblo, knew of the importance of the issue to the city of Trinidad. In March 1965, Evans reintroduced the cash deletion measure as HR 6969. When Congress passed the 1965 Flood Control Act, it took notice of Trinidad's circumstances and integrated Evans' bill into the larger document. This lifted the burden of nearly $600,000 from the backs of local water users,

and added a similar cost to the federal share of Trinidad Dam.[34]

The Evans measure brought to light the continuing problems of irrigation contracts being negotiated between Trinidad water users and the Bureau of Reclamation. As the project became more expensive, local interests assumed less of the financial costs all around. Senator Ellender again grew irritated in 1966 when the Corps informed him of the slow pace of contracting at Trinidad. When the Albuquerque District first submitted its reservoir plans in 1958, it called for local farmers to repay the costs of 55,000 acre-feet of storage. Even the interest-free, 75-year schedule proved too much for Trinidad, and Reclamation felt obliged to reduce the amount of stored irrigation water to 20,000 acre-feet. The original irrigation estimate of 51 percent [over $9 million] would have to be repaid to the U.S. Treasury, but all that Congress could now recapture would be $6.4 million, despite the escalating production costs. "This is the fifth or sixth project," Ellender told the Corps, "on which the irrigators have failed to sign a contract with the Interior. They are not willing to make a firm commitment to pay for and use this water, when the project is completed." Not only was this bad business practice, but it embarrassed the Corps as well. "You are more or less at the mercy of the Interior Department," the chairman concluded, and he asked the Corps to "look into the validity of [Bureau of Reclamation] claims . . . to see whether or not they can do what they say they will do."[35]

Trinidad Dam funding difficulties reached a conclusion of sorts in 1967. All major ditch companies had agreed to the new 20,000 acre-feet limit of storage repayment. The Albuquerque District then established a real estate suboffice in Trinidad to begin the multimillion-dollar purchases that the project required. The state of Kansas voiced official concern over the management procedures of the reservoir, but decided to wait for completion before passing judgment. Then Congress and the President locked horns over LBJ's surcharge on income taxes to pay for the Vietnam war. The President halted payment on all public works contracts until Congress supported his revenue measure. This jeopardized the $5 million construction of outlet works for Trinidad Dam, and caught the Corps by surprise. An aide for Colorado Senator Gordon Allott reported that the Corps viewed "the whole play as childish," but warned water users that if the tactic succeeded, LBJ would "use it more and more."[36]

In 1968 the first contracts were finally drawn up to begin construction at Trinidad Dam. The problems of land acquisition, especially the $8.6 million to relocate the Colorado and Wyoming railroad tracks, kept progress at less than optimum speed. But the Albuquerque District closed the gates of the Colorado structure in June 1977, and began operations of the multipurpose reservoir. The project consisted of an earthfill dam 6,610 feet long, 200 feet high, capable of retaining 114,000 acre-feet of water. This broke down to 51,000 acre-feet for flood control, 39,000 for sediment, 20,000 for irrigation, and 4,500 acre-feet for a recreational pool. Water for this latter function would be provided by the State of Colorado, with facilities managed by the state Game and Fish Department. The federal share of Trinidad Dam expenses had grown to $44 million, of which only 14 percent would be repaid by irrigation users. The non-federal costs were $6.8 million, much of that for water purchases for the permanent pool. The dream of J. C. Caldwell, James E. Donnelly, J. Edgar Chenoweth, and other local supporters had finally come true.[37]

The work of the Albuqueque District in its Colorado river basins did not end with the completion of Trinidad Dam, but it did undergo significant transformation. The District had a series of small authorizations for local flood pro-

tection on the Rio Grande, the Arkansas, and their tributaries, none exceeding $250,000. But the management of water resources in Colorado required an organization with expertise, highly trained personnel, an understanding of arid region water policy, and a national network of economic and political support. For these reasons the Albuquerque District opened a Project Office in Pueblo in 1980 to coordinate its many civil works tasks in southern and eastern Colorado, and to continue planning for Pueblo Dam.[38]

The diversity of tasks and the vagaries of political and economic forces in the Southwest had a profound impact on local flood protection work of the Albuquerque District. When compared to military construction or the mainstem dams and reservoirs, the projects undertaken on the Rio Grande, Pecos, and the Arkansas rivers were of a lower profile. Yet the communities affected by intermittent flood disasters saw their channel, levee, and reservoir facilities as important to their well-being as the larger and more costly sites at Conchas, John Martin, Abiquiu, or Cochiti Dams. Whether it was protection of sprawling urban centers such as Albuquerque, water rights litigation on the Pecos, or providing low-cost flood control work in southern Colorado, the District managed to overcome barriers of political intrigue, fiscal stringencies, and engineering difficulty.

As the Albuquerque District headed into the 1980s, its experience in local flood work would become more common. The District's history had seen large projects, military construction of an international significance, and major changes in lifestyles for many Southwestern residents. The opening of the Pueblo Project Office served as a reminder that the 1980s and 1990s would require of the Albuquerque District other talents, and create new opportunities. The work in the Rio Grande, Pecos, and Arkansas valleys would serve as a guide to where the District had succeeded in such endeavors, and what mistakes to avoid as it neared its second half-century of existence.

XII
THE NEW REALITIES: ENVIRONMENTALISM, REALIGNMENT AND WORK FOR OTHERS, 1970-1985

The Albuquerque District entered its fourth decade of existence with mixed emotions. The successes of its projects in military construction and civil works were readily apparent. Yet the loss of its workload on military bases in the region presented only the first of many challenges to maintenance of a high District profile in the Southwest. Passage of environmental legislation meant new criteria for the development of western water projects, while completion of most major facilities by the late 1970s brought into question the necessity for a full-time civil works component in Albuquerque. The District weathered these storms, however, and emerged on its 50th anniversary in 1985 as an institution still prepared to contribute to the growth and expansion of the region it had served since the 1930s.

The transfer of military construction to Fort Worth in 1970 had decimated the ranks of the Albuquerque District staff, both through reassignment and the early retirement of key personnel. Thus when the Army Engineers had to face the shift of public opinion towards environmental consciousness, the District lacked the manpower and experience to adjust quickly and thoroughly. In addition, the District had lost its most effective advocates in Congress. Dennis Chavez had died in 1962, and Clinton P. Anderson paid less attention to Corps projects as he built the New Mexico infrastructure of nuclear weapons laboratories and testing facilities. When Anderson retired in 1972, the New Mexico senatorial delegation consisted of an untried Republican freshman, Pete V. Domenici, and Democrat Joseph M. Montoya. The troubles of the 1970s had their roots in these phenomena, and foreshadowed a decline of District work and morale that did not revive until the early 1980s.

Environmental awareness had been awakening nationwide since the late 1950s. The explosion of western population growth after World War II strained natural resources such as soil, air, and water, even as migrants demanded access to them in pursuit of the "good life" of the postwar era. Organizations such as the Albuquerque District had moved rapidly to create a physical environment compatible with these desires for open space, outdoor recreation, and cheap sources of water and energy. The District, as did its counterparts all over the West, met these challenges by hiring many individuals trained in engineering tasks. The Corps also formed liaisons with political and economic officials supportive of the growth ethic. This equation meant prosperity for many, and visions of future opportunity unclouded by signs of trouble.[1]

The decade of the 1960s prompted reassessment of many national policies rooted in the expansion of American society since 1945. Among these was the abuse of the nation's resources by public and private entities. In 1969 Congress enacted Public Law 91-190, the National Environmental Policy Act [NEPA], to address demands for restrictions on environmental abuse. NEPA called upon all federal agencies to incorporate into their development plans the ecological con-

sequences of the work, and to suggest alternatives where feasible. The section of NEPA that most affected the Corps required preparation of Environmental Impact Statements [EIS] on all federal construction projects. The general public would be informed of these reviews, and would be welcomed at open forums to discuss the findings.[2]

This abrupt change in federal policy surprised many District personnel. Because the legislation did not articulate policy for all contingencies, the District and the Office of the Chief of Engineers spent the next several years groping for workable solutions. The early EIS's consisted of a dozen pages or so of statements on the general consequences of a particular project. Veteran District personnel had several opinions on the merits of NEPA. Some found it absurd, others a nuisance, while the majority adopted a cautious approach awaiting more clarification from Congress, the courts, and Corps headquarters.

Soon after passage of NEPA, Congress extended the regulatory work of the Army Engineers by enacting the Federal Water Pollution Control Act of 1972 [FWPCA]. Section 404 of this act upheld the provisions of the Rivers and Harbors Act of 1899, the so-called "Refuse Act." Section 10 of that act had ordered the Corps to regulate all sources of effluents in the nation's navigable streams. Any individual or organization wishing to alter the streamflow in any fashion had to apply to the Army Engineers for a permit. The Corps would investigate all such requests and could prosecute violators at its discretion. The Refuse Act also encouraged the general public to inform the Corps of polluters by offering a percentage of the fines collected as a reward.[3]

The provisions of FWPCA became known as "404 work" to Corps officials and personnel. Yet response to the program mirrored the confusion surrounding NEPA and the environmental impact statements. John Testa, a citizen of Alamogordo, New Mexico, wrote to Joseph Montoya to voice his support for the provisions of these environmental statutes. Testa's letter drew an answer from OCE, wherein the Chief's Office revealed the conflicts facing the Corps on environmental matters. Colonel Carlyle Charles, an Assistant Director of Civil Works, told Testa: "The Corps is attempting to reconcile these differences and to fulfill the will of the people as expressed through Congress." Charles hoped that Testa's suggestions for wastewater treatment programs and protection of wild and scenic rivers would become national policy for the Corps and other water agencies.[4]

The debate within the Corps over the extent of 404 work intensified with adoption of regulations nationwide. In 1974 the Army Engineers interpreted the FWPCA to include only navigable streams, as it had done with Section 10 of the Refuse Act. This left the bulk of United States waters beyond Corps control, including all streams within the Albuquerque District. Environmental groups detected a desire by the Corps to avoid Congressional directives, and instigated the suit of *Natural Resources Defense Council v. Calloway* to force compliance by the Army Engineers. The United States District Court for the District of Columbia ruled in March 1975 that the Corps had to embrace waters beyond "the traditional tests of navigability," and ordered the Chief's Office to draft new regulations with more authority and force.[5]

The *Calloway* decision marked yet another blow to the traditions of districts such as Albuquerque. The internal struggle over environmental policy led OCE to release a statement to the press on 6 May 1975 outlining its proposed new regulations. With an eye towards concerned public opinion that might force Congress to redefine the 404 clause, Brigadier General Kenneth McIntyre, Dep-

uty Director of Civil Works, instructed the Public Affairs Office of OCE to frame the press release in provocative prose. Senator Joseph Montoya received notice that the Corps might have to issue permits to any water user, no matter how small the operation, and that "millions of people may be presently violating the law." Fines of up to $25,000 and imprisonment of one year could accompany conviction, and defendants would pay the cost of cleaning all materials deposited in United States streams without a 404 permit.[6]

Like other political leaders, Montoya received dozens of letters from irate constituents and pressure groups throughout the Southwest on the matter of the Corps' 404 work. Raul H. Castro, Governor of Arizona, feared that these new regulations duplicated state programs, and that western streams would fall under the Corps' purview despite their non-navigable status. Barry Goldwater, Republican Senator from Castro's state, warned that Arizona's irrigated agriculture stood in jeopardy, even with Corps pledges to the contrary. The State of New Mexico expressed similar sentiments that led Montoya to support legislation modifying the 404 proposals.[7]

The Corps' strategy had its desired effect, though not without further straining relations with environmentalists. In July 1975 the Corps issued new criteria for its 404 work in a conciliatory tone, and retracted some of the more strident rhetoric of its previous announcement. This prompted Lieutenant Colonel William D. Horton, Jr., Deputy District Engineer for Albuquerque, to prepare remarks to be given before environmental groups on the larger subject of Army Engineer environmental policy. Horton acknowledged that neither the Corps nor its critics had escaped untarnished from the ecology debate, and that a useful dialogue deserved attention. "Under today's rules," Horton admitted, "economic values no longer have the same overriding priority they once had." Horton called for more serious appraisal of nonstructural options, such as enforcing flood plain management codes. He also wondered whether the public would accept the cost of more studies, delayed projects, and enlarged capabilities at Corps civil works sites. Horton believed that the citizenry would "roll with the punches through this period of transition," and that the results would mean "a better country for all of us."[8]

As the Albuquerque District adjusted to these new requirements, the late 1970s brought into question both the policies of the District and its very existence. President Jimmy Carter did not hide his displeasure with the nationwide civil works mission of the Army Engineers. Even as he entered the White House in 1977, Carter and his advisors promulgated a list of 19 federal water projects to be eliminated from the 1978 budget. Of these, 11 came under the jurisdiction of the Corps. Although none of the affected projects belonged to the Albuquerque District, the President's desire for a reduced workload echoed throughout the Corps. From these changes in policy came the 1979 realignment study of the Southwestern Division [SWD], which made several recommendations about the future of the Albuquerque District.[9]

By the late 1970s the Corps had reduced the size of the Albuquerque District by nearly 80 percent. At its peak in the mid-1960s the District workforce exceeded 700 positions in civil works and military construction. When the District submitted its final report to OCE in June 1979 it recommended 128 slots in the Albuquerque District staff, but did not suggest termination of the office. Even though the reduced staffing rendered District productivity potentially "marginal," the Division argued successfully that the Albuquerque District's "uniqueness" placed it beyond the reach of the Carter administration budget of-

fice.

In assessing the strengths and weaknesses of the Albuquerque District, the Division commented upon several factors that had shaped the District's history. OCE had directed its divisions to close all offices that could not maintain a certain threshhold of spending. These criteria included less than $40 million in general construction work, an inability to secure and retain talented employees, and "no foreseeable increase in future workload."

In the judgment of SWD, the Albuquerque District met none of the above criteria, but had other extenuating circumstances which outweighed the national standards utilized by OCE. The District had the best expertise in mountain and desert terrain of any Corps unit in the West, even though several West Coast and Midwest districts extended into the region. New Mexico politicians balked at transferring all civil works operations and maintenance to Fort Worth District, because that would place Texas water officials in control of New Mexican streams. The distances traveled by Fort Worth personnel to Albuquerque District sites would increase costs, offsetting the benefits of consolidation and reducing the effectiveness of customer service. The Division then concluded by noting the social consequences on the transferred employees. The District had an "excellent record" of hiring women and minorities because the State of New Mexico had a more diverse mixture than Texas. The 1970 removal of military construction work to Fort Worth had placed a strain on minority employees, and SWD wished to avoid the loss of morale that a similar move would cause.[10]

The conclusions reached by the Southwestern Division complemented the support given the Albuquerque District by important civic and political leaders of the region. Ray Kogovsek, Democratic Congressman from the Third District of southeastern Colorado, spoke of his good working relationship with the District and his desire to retain its talents in managing Colorado's unusual hydrologic environment. Colonel Joseph C. Rodriguez, Director of Facilities Engineering at Fort Bliss, told SWD that he worked more closely with New Mexico engineering and construction firms than with any other area. "It is difficult to explain why," the Colonel mused, "but this shorter distance [to Albuquerque] seems to immeasurably improve communications." Senator Pete Domenici brought the issue into the sharpest focus, telling the Corps: "In today's climate of opinion, the construction of civilian water resource projects is as much a political and social task as an engineering one." A large centralized bureaucracy might save money on paper, but would suffer from "a lack of appreciation of the nuances of a given local situation." Domenici went so far as to recommend a return of military construction to the Albuquerque District, and warned SWD that it "would be ill-advised to take any steps that would reduce its responsiveness to the people of New Mexico."[11]

Despite this testimony, in the spring of 1979 the Albuquerque District stood on the verge of extinction. Employees heard rumors of job transfers to other districts, and some personnel prepared for removal to Tulsa or Fort Worth. Then a heavy snowpack statewide resulted in massive runoffs in the Gila River basin and in the upper Rio Grande near Taos. The quick response of the District saved many lives and millions of dollars in flood damages. State political leaders realized that the Albuquerque District was the only federal organization of its kind in the Southwest, and pressured OCE to reconsider its plans to close the District office.[12]

In June 1979 the Southwestern Division rendered its final opinion on the fate of the Albuquerque District. Some of these ideas would be accepted by OCE,

while others met opposition from political and civic leaders around the region. The Division sought creation of one large civil works district encompassing all of Colorado and New Mexico, with Albuquerque as the headquarters. The unit would be renamed the "Rocky Mountain District," to reflect its peculiar environmental qualities. This would enhance the workload of Albuquerque, and remove the situation where four Engineer districts served New Mexico and five operated in Colorado. The Albuquerque District would lose its authorities on the Arkansas River in western Kansas to the Tulsa District, while Fort Worth would assume control of the Pecos River and Rio Grande projects below the New Mexico state line. Political considerations prevented complete acceptance of these plans, however, and the only results were retention of the District, elimination of its Kansas work, and continuation of the Corps tradition of naming districts after their headquarters city.[13]

The respite given the Albuquerque District in the late 1970s did not remove the danger of elimination in the future. The District had accepted its reduced status and increased regulatory and environmental demands. But the need for a minimum construction workload to maintain cost-effectiveness confronted the new District Engineer, Lieutenant Colonel Julian Emory Pylant, when he assumed command in July 1981. The administration of President Ronald Reagan promised to revive military agencies like the Army Engineers with its dramatic increases in national defense spending. But the absence of military construction work placed the District at a disadvantage. All major defense installations in the state of New Mexico received appropriations of millions of dollars for facilities and improvements, but the Fort Worth District controlled the management of these authorities. Colonel Pylant had to locate a percentage of new defense outlays to keep his district intact, and to be ready in case of a national war emergency. From his efforts came design work for Fort Worth and other districts on their military programs, and management of construction operations on the Waste Isolation Pilot Project [WIPP] near Carlsbad, NM.[14]

While the Albuquerque District faced its uncertain future, events in the southeastern part of New Mexico created the opportunity the District needed for its survival. This was the testing and construction of the WIPP site, designed to store low-level materials contaminated by uranium during nuclear weapons production. Since the 1950s the Atomic Energy Commission [AEC] had searched nationwide for a suitable location for these types of materials. When scientists determined in 1957 that salt formations offered the most secure environment, test holes were drilled in several parts of the country. By the early 1970s the successor to the AEC, the Earth Resources Development Agency [ERDA], later called the Department of Energy [DOE], began studying the Delaware Basin southeast of Carlsbad, and in 1976 began permanent work on what was known as the Los Medanos site.

The existence of a thick layer of salt over 2,000 feet below the surface of the earth at Los Medanos was the critical factor in DOE's choice of a future storage facility for low-level nuclear wastes. The State of New Mexico kept a close eye on these events, and when the Pennsylvania nuclear power plant at Three Mile Island experienced difficulty in 1979, New Mexico demanded more information from DOE and more control over storage at the WIPP site. This led to extended legal and political battles between the state government and DOE, culminating with an agreement in 1981 by the federal government to give some authority over shipments to the state. New Mexico officials assumed this to be a "veto power," but no written memoranda appeared to support this contention.

When the Reagan administration came into office that same year, it rejected the principle of this compromise and led to yet more debate between DOE and state officials.[15]

Pressure by environmental and political organizations on DOE exacerbated the internal problems of management and construction at the WIPP site. DOE had limited capabilities in engineering and construction work, and needed to hire a vast array of personnel to complete the $2.1 billion project on time. At first DOE contracted with private firms such as Westinghouse for technical expertise and Bechtel Corporation for design, but construction management emerged as a major concern. In November 1980 DOE began looking for an organization able to deliver the project within budget and on schedule. This led to preliminary talks with the Albuquerque District, whose representatives were only too glad to undertake the challenge of managing the work at the WIPP site. Although the District had not constructed a project of this type before, it understood the scope of the work, and had trained personnel who had participated in large-scale construction projects at Kirtland Air Force Base, White Sands Missile Range, Cochiti and Santa Rosa Dams.[16]

Even though the Albuquerque District and DOE believed that they had a good match, the District had to convince its superiors of the wisdom and efficacy of this type of construction project. The Corps had long conducted a program known as "Work for Others," where various districts served as consultants to federal, state, and local agencies on a limited basis. Upper-echelon Corps officials regarded such tasks as secondary to their civil works functions, and categorized the WIPP site in that fashion. Colonel Pylant needed to convince the SWD Engineer, Brigadier General Hugh Robinson, of the merits of the WIPP work, and then carry his message to OCE officials in Washington. General Robinson gave Pylant his blessing, and redefined the concept of "Work for Others" as "Federal Engineering." General Robinson and Colonel Pylant agreed that the Corps should seek agreements with any and all federal agencies, offering Corps expertise and talent where major projects needed sophisticated management and firm control.[17]

After several visits to OCE headquarters, Colonel Pylant returned to New Mexico in June 1982 with permission to finalize a negotiated agreement with DOE to undertake the construction at the WIPP site. The Albuquerque District could then add new positions, allowing several former employees of the Albuquerque and other Districts to return from duties in Saudi Arabia. There they had experienced desert conditions and isolated working arrangements, which stood them well in their new posts at Carlsbad. The District immediately established criteria for contracting, quality control, safety procedures, and work schedules. The results achieved by the District were a sharp reduction in costs, an acceleration of the overall completion date by nearly two years [to October 1986], and tempering of the most serious threat to construction, lost man-hours and fatalities. By mid-1985 only one employee had died while on the job. The statistical average for work of the degree of difficulty of WIPP was 10 fatal accidents per year, and the District took great pride in this achievement.[18]

The Albuquerque District reached the peak of its activities at the WIPP site in 1985. Construction of the 2,150-foot shaft had been completed two years earlier, with excavation of the storage rooms soon thereafter. The most difficult task underground had been the drilling and cut and slash excavations of two shafts by a Japanese firm, Ohbayashi-Gumi, of Tokyo. When the District accepted Ohbayashi's bid in 1983, it caused the second-place offeror, a German

firm known as Thyssen Mining and Construction, Inc., to sue on the grounds of Ohbayashi's unfitness to perform the work. The District had adhered to a meticulous standard of judging all proposals, and prevailed in U. S. District Court in Albuquerque in late 1983. Judge Howard Bratton did note that the District "could have made more thorough inquiry" into Ohbayashi's shaft-sinking experience, but concluded that the District was "responsible, not arbitrary and capricious" as Thyssen had claimed. Once Ohbayashi completed its work, the remaining tasks for the District would be above ground, notably the Waste Handling Building, set for completion in early 1987. Storage of nuclear waste would then begin after all structures and systems had been tested and approved.[19]

The prospects of more "Work for Others" assumed a higher profile in Albuquerque District planning as the 1980s progressed. The Reagan administration sought increased local participation in civil works projects by raising the percentage of contributed funds known as "cost-sharing." In a manner similar to the "partnership principle" used by the Eisenhower administration, Reagan's people hoped to reduce the huge budget deficit by requiring local promoters of water projects to finance 35 percent or more of the costs of any facility. While this maintained the semblance of "free enterprise" held by the Reagan staff, it did not square with the reality of funding western water projects. In good economic times the states of the West could not have afforded these activities without major federal support, aided by liberal repayment contracts on irrigation works or multipurpose flood control reservoirs justified by recreational benefit potential.

The Albuquerque District recognized that payment of larger shares by local interests would jeopardize its civil works schedule for years to come. The State of New Mexico ranked in the bottom 10 nationally in per capita income, and the state's budget relied heavily upon the volatile oil and natural gas industries for the bulk of its revenues. In 1983 all 14 Republican senators from the West wrote to Ronald Reagan and his assistant secretary of the Army for civil works, William Gianelli, to protest this new policy. The Senators agreed that more local support should be offered, but warned the White House that western economic development faced serious obstacles without new sources of water. Local project sponsors in the Albuquerque District offered similar comments. Colonel Pylant concurred in these judgements and informed the SWD Engineer, Brigadier General Robert J. Dacey, that "this bottleneck issue" could render "orderly and predictable progression through the planning process [to be] difficult, if not impossible."[20]

In 1983 the cost-sharing problem and environmentalists hampered District plans for flood protection along a one-mile stretch of the Santa Fe River. In some ways the torturous path taken by the District in designing a project for downtown Santa Fe typified all the problems of the preceding decade. Since the late 1930s the Albuquerque District and its predecessors had conducted studies of flood control for the capital city of New Mexico. Each proposal was rejected in spite of two floods in the postwar era that produced significant property damage. The Albuquerque District conducted many surveys, public hearings, and private meetings, and spent hundreds of thousands of dollars, only to face defeat in July 1983 when a divided Santa Fe city council voted down the latest offer.[21]

When the Albuquerque District first entered the Santa Fe River watershed in 1957, it responded to flooding that inundated the streets along the riverbank. Local political officials approached Senator Dennis Chavez and Representative

John J. Dempsey to acquire emergency construction funds from the Army Engineers. By 1959 the Albuquerque District had completed $104,000 worth of repairs to flood walls in the downtown area and along the Arroyo Mascaras above town. In 1961 the New Mexico congressional delegation asked the Corps to devise more permanent facilities, and throughout that decade the District provided local citizens with several alternatives.[22]

The first plan for flood protection in the Santa Fe River basin called for construction of a multipurpose reservoir on Aztec Springs Creek at its confluence with the Santa Fe River. This stream had carried the brunt of the 1957 flood waters, and would require 13,500 acre-feet of storage to protect the city. When the Albuquerque District examined the cost-benefit ratio of the Aztec reservoir in 1965, it learned that the initial cost of $10.5 million would provide only $1 million in flood protection. Local water users also could not pay the $6.5 million for storage of the municipal water supply at Aztec. The city limited access to the Aztec site because of the location of Nichols reservoir just upstream, where the New Mexico Power Company [renamed the Public Service Company of New Mexico in the 1970s] operated the city's reservoir. Finally, the Rio Grande Compact did not permit additional permanent storage on the Santa Fe River, making the option of a recreational pool unavailable for inclusion in the cost-benefit analysis.[23]

The deletion of Aztec reservoir from the Santa Fe River flood planning forced the Albuquerque District to redraw its proposals. In 1968 a second flood rushed through downtown Santa Fe, tearing out bridges and utility lines and flooding local residences. This sent the city fathers again to the Army Engineers for help, and in 1972 a new version of the Santa Fe River project appeared before the community.

In the intervening years the rise of environmental consciousness had affected the Albuquerque District in many ways, but none had quite the impact of the public response in Santa Fe. Several dozen local residents spoke at a open meeting on 1 March 1972 in opposition to the latest Corps idea: a flood control reservoir at Granite Point above town in Santa Fe Canyon. At this meeting critics pointed out the incomplete nature of the project's environmental impact statement, the $2.7 million price tag, and the noise and disruption of the tranquil neighborhood caused by construction traffic. Several speakers asked about nonstructural alternatives, to which the New Mexico state engineer replied that removal of housing and businesses from the flood plain was the only other option. The city council failed to endorse Granite Point Dam at that meeting, and asked the District to prepare yet another study.[24]

When the Albuquerque District returned to the Santa Fe city council in 1981 with its next proposal, much had changed in the design for the Santa Fe River project. Residents of the neighborhood affected by the proposed Granite Point Dam had created an interest group called the Santa Fe Canyon Associaton [SFCA]. Along with related organizations, the SFCA had petitioned Senators Joseph Montoya and Pete Domenici in 1975 to require the Albuquerque District to suggest other means of flood protection for the town. Domenici took their case to the floor of the U.S. Senate, attaching an amendment to the Water Resources Development Act of 1976. The senator wanted the District to explore increasing the capacity of Nichols reservoir and channelization of Arroyo Mascaras, rather than construction of Granite Point Dam. In a victory for the SFCA and enviromentalists, Domenici ordered that flood protection work in Santa Fe would "not include construction of impoundments east of the existing

Nichols Dams, and . . . that in any earth moving operations . . . the sources of materials and the routes for transporting such materials . . . [would] be selected in a way that [would] minimize any adverse effect on normal transportation movements within the city of Santa Fe."[25]

By the time the Albuquerque District had devised another plan to conform with the restrictions of the 1976 legislation, the dynamics of Santa Fe policymaking had changed yet again. The late 1970s witnessed an influx of middle- and upper-middle class people attracted to the "City Different" as a refuge from the harsh winters and urban blight of the eastern United States. In addition, Santa Fe exhibited a toleration for the eccentric and the unusual that reached back to the "art colony" days of the 1920s. These individuals sought an interesting lifestyle in a quaint Southwestern town, and many became involved in local political affairs. Their presence created a dilemma for city planners and councillors, as these people had little knowledge of past events in Santa Fe history, yet desired to reshape the community to fit their tastes in urban living. This finally triggered a chain of serio-comic events from 1981 to 1983 that ended District planning for the Santa Fe River, and left the town no more protected than before.[26]

On 21 October 1981 the Albuquerque District sent its representatives to the Santa Fe city council chambers to offer several options. The rapid downtown development of art galleries, boutiques, restaurants, and shops along and near the river made flood protection of the utmost importance. The District mentioned bridge replacement to remove obstructions to the stream flow, low-wall constructon, and deepening of the channel to increase the passage of floodwaters through town. The council asked for final plans on all three procedures, and the District complied in January 1983. At this point the question of flood protection became enmeshed in the larger debate over city expansion, and all hope for rational dialogue vanished.

From early 1983 until the decisive vote against the project that July, the Albuquerque District held three information sessions for residents of Santa Fe. A conflict had also arisen over development of city property near the Santa Fe Opera on the city's northwest side. The "Northwest Quadrant" proposal frightened many citizens who saw their councillors as willing participants in the unchecked urbanization of Santa Fe. Paving of a one-mile section of the river appeared to be part of this overall development mania, and attendees at the May and June sessions on the river project spoke with conviction against despoliation of the last open space in an already over-crowded downtown. Anna Manana drew loud applause at the May meeting when she compared the project to the 1979 nuclear accident at Three Mile Island and linked the Army Engineers to this disaster. "This is only a river, you know," said the representative from the Santa Fe Historical Society, and she charged that "if you [the District] can't build a nuclear power plant right, how can we trust you to build a river right?"[27]

In the face of such public misperceptions, the Albuquerque District could not fully explain its intentions. The District had designed a channel that would carry 5,000 cubic feet of water per second through town, a figure representing a potential "one-hundred year flood." At the public meetings citizens believed that the Corps wanted to "over-protect" the city, rather than understanding that the 100-year flood was a statistical average that could recur frequently, even within the same year. The momentum of opinion worked against the District, and when Dr. Thomas Chavez, associate director of history at the Museum of

New Mexico, testified that no such flood as the Corps predicted had occurred in the 374-year history of Santa Fe, the audience applauded his presentation. Then on 13 July 1983, the city council bowed to the will of the voters and rejected by a six-to-two margin any further involvement in the Santa Fe River project. The $6.2 million allocated by the District for the flood control work reverted to the U.S. Treasury, and the Santa Fe River project went on inactive status.[28]

The defeat in Santa Fe symbolized the challenges presented to the Albuquerque District by the uncertainties of the 1980s. The design of the channel did seem repugnant to citizens lamenting the loss of so much open space in the historic downtown area. The *Santa Fe Reporter* declared the saga of the flood control project one of its "Top Ten" stories for 1983, and praised those who "took the river seriously" when the Corps wanted to change it. But nature dictates that one day Santa Fe will probably experience a flood of the magnitude projected by the Albuquerque District, at which time outraged property owners will demand immediate action. By then another generation of Santa Feans will have control of municipal affairs, and perhaps a more reasoned compromise will offer protection from the inevitable flash flooding that plagues all of the Mountain West.[29]

The loss of construction work in the Santa Fe River basin did not threaten the survival of the Albuquerque District, but it did reveal the complexities of civil works in the 1980s. Because the major water projects had been completed, the District faced the need for additional projects to keep its highly trained staff prepared for regional and national emergencies. Lieutenant Colonel David E. Peixotto took command of the Albuquerque District in July 1984, and soon realized what had become apparent to his predecessor, Colonel Emory Pylant. The District had to rely upon its "Work for Others" to maintain its presence in the Southwest and assume tasks for other agencies not related to traditional water projects. Peixotto formulated a policy of "diversification," whereby his District informed a variety of governmental bodies about the capabilities of the Corps in design and management of construction programs. The Albuquerque District hoped to become a Corps "center of expertise" for nuclear waste storage technology, much as the Portland District did for hydroelectric power. The District also would actively seek construction work from the Department of Energy at its Sandia and Los Alamos laboratories, along with reinstatement of some of the military construction functions that had left the District 15 years before.[30]

As the District and its employees reflected on the events of their first half-century of existence, they could point with pride to many accomplishments. Major flood control projects stand on the Canadian and Pecos Rivers, and the Rio Chama and Rio Grande in New Mexico, and on the Purgatoire and Arkansas rivers in Colorado. The District has constructed flood protection facilities from El Paso, Texas, to Colorado Springs, Colorado, to Dodge City, Kansas. In addition, Albuquerque District employees participated in the creation of the Los Alamos Project and prepared the Alamogordo test site for detonation of the first atomic weapon in 1945. They then built the postwar infrastructure of Fort Bliss and White Sands Missile Range, along with Kirtland, Cannon, and other military bases across the Southwest.

In their desire to serve their country and the region in which they lived, the staff and management of the Albuquerque District encountered many obstacles that tested their abilities and questioned their commitment to public service. The uniqueness of New Mexico's geography and climate required special

engineering skills, while the social and political consequences of the Corps work demanded a high degree of sensitivity to the history and culture of the region. Changing public emphasis on economic and environmental matters challenged the District but also taught it to strengthen those areas of expertise needed for a successful response to public needs. By 1985 the Albuquerque District had come far from the isolation of Captain Hans Kramer's construction camp on the banks of the Canadian River. But the spirit of activism instilled in his subordinates at Conchas Dam echoed down through the years, and Captain Kramer's disciples carry on his wish to make New Mexico and the Southwest a better place for all who reside there.

ENDNOTES

I

[1]Walter Prescott Webb, *The Great Plains* (New York: Grosset and Dunlap, 1931, 1976), pp. 3-9.

[2]A more detailed analysis of the work of the Spanish Engineers is contained in Janet R. Fireman, *The Spanish Royal Corps of Engineers in the Western Borderlands, 1764-1815* (Glendale, CA: Arthur H. Clark Co., 1977).

[3]The best source on Spanish-Indian relations is Edward H. Spicer, *Cycles of Conquest* (Tucson: University of Arizona Press, 1959). For an overview of Spanish exploration and settlement in the Southwest, consult John Francis Bannon, *The Spanish Borderlands Frontier, 1540-1821* (Albuquerque: University of New Mexico Press, 1974). A collection of essays that analyze Spanish politics in the region, including her scientific interest, is David J. Weber, ed. *New Spain's Far Northern Frontier, 1540-1821* (Albuquerque: University of New Mexico Press, 1979).

[4]There are two sources on the Topographical Engineers in the West that are thorough and analytical. They are William Goetzmann, *Army Exploration in the American West, 1803-1863* (New Haven: Yale University Press, 1959), and Goetzmann, *Exploration and Empire: The Explorer as Scientist in the Winning of the American West* (New York: W. W. Norton, 1966). The latter work won the Pulitzer Prize for non-fiction in 1967.

[5]Goetzmann, *Army Exploration*, pp. 37-41.

[6]Ibid., pp. 123-27.

[7]Ibid., pp. 144-49.

[8]Ibid., pp. 212-17.

[9]The material in this chapter on the Kern brothers is found in Robert V. Hine, *Edward Kern and American Expansion* (New Haven: Yale University Press, 1962). Also see David J. Weber, *Richard Kern: Expeditionary Artist in the Far Southwest, 1848-1853* (Albuqueruque: University of New Mexico Press, 1985).

[10]Hine, *Edward Kern,* pp. 67-86.

[11]Goetzmann, *Army Exploration,* pp. 239-44.

[12]Ibid., pp. 241-42.

[13]The best overview of Henry Clay's plan of public works, known as the "American System," is in George Dangerfield, *The Awakening of American Nationalism, 1815-1828* (New York: Harper Torchbooks, 1965). For an understanding of Andrew Jackson and his policies, see Glyndon G. Van Deusen, *The Jacksonian Era, 1828-1848* (New York: Harper Torchbooks, 1959).

[14]Goetzmann, *Army Exploration,* p. 304.

[15]The best source of information on the Engineers and western public works prior to the Civil War is W. Turrentine Jackson, *Wagon Roads West: A Study of Federal Road Surveys and Construction in the Trans-Mississippi West, 1846-1869* (Berkeley: University of California Press, 1952).

[16]Ibid., pp. 107-20.

[17]The source cited for much of the information on the Wheeler Survey is Richard A. Bartlett, *Great Surveys of the American West* (Norman: University of Oklahoma Press, 1962), pp. 333-76.

[18]Ibid., pp. 356-61.
[19]Ibid., pp. 361-62.

II

[1]The best analysis of the territorial period in New Mexico is Howard R. Lamar, *The Far Southwest, 1846-1912: A Territorial History* (New York: W. W. Norton and Company, 1970). Also see Robert Larson, *New Mexico's Quest for Statehood, 1846-1912* (Albuquerque: University of New Mexico Press, 1968). New Mexico made 50 appeals to Congress for statehood, all of which were rejected until 1910.

[2]The writings on the literati of the 1920s in New Mexico are voluminous. The latest attempts to coordinate the prolific outpourings of these people are Arrell M. Gibson, *The Age of the Muses: The Santa Fe and Taos Art Colonies, 1900-1942* (Norman: University of Oklahoma Press, 1983), and Robert White, *The Taos Society of Artists* (Albuquerque: University of New Mexico Press, 1983).

[3]The decade of the 1920s in New Mexico has received little attention from scholars both in-state and elsewhere. The best source on the period, and the subsequent economic hard times, is Gerald D. Nash, *The American West in the Twentieth Century* (Albuquerque: University of New Mexico Press, 1977).

[4]The best general work on the period that witnessed the professionalization of engineering is Robert N. Wiebe, *The Search for Order: 1877-1920* (New York: Hill and Wang, 1967). A book that studies the interconnectedness of engineering and politics after 1900 is William E. Akin, *Technocracy and the American Dream: The Technocrat Movement, 1900-1941* (Berkeley: University of California Press, 1977).

[5]Michael C. Robinson, *Water for the West: The Bureau of Reclamation, 1902-1977* (Chicago: Public Works Historical Society, 1979), pp. 18-23; Robert G. Dunbar, *Forging New Rights in Western Waters* (Lincoln: University of Nebraska Press, 1983), pp. 162-72; Gene M. Gressley, *The Twentieth-Century American West: A Potpourri* (Columbia: University of Missouri Press, 1977), pp. 78-81.

[6]Beatrice Hort Holms, *A History of Federal Water Resources Programs 1800-1960* (Washington, DC: U.S. Department of Agriculture, 1972), pp. 5-12.

[7]U.S. Congress, House, H. Doc. 308, 69th Cong., 1st sess., 13 April 1926. Carl Hayden had established a close relationship with the Bureau of Reclamation to provide irrigation water throughout Arizona along the Colorado River, and participated in the writing of much Congressional legislation on water projects.

[8]U.S. Congress, House, H. Doc. 371, 71st Cong., 2d sess., 28 April 1930.

[9]A useful general study of the Twenties and the Depression nationwide is William E. Leuchtenberg, *The Perils of Prosperity* (Chicago: University of Chicago Press, 1958).

[10]James T. Patterson, "The New Deal in the West," *Pacific Historical Review* 38 (August 1969): 317-27.

[11]Report on Conchas Dam, Canadian River, New Mexico, for Task Force on Water Resources and Power Commission on Organization of the Executive Branch of the Government, April 1954, Personal Papers of Lavonne Mueller, Conchas, New Mexico.

[12]Report on Conchas Dam, April 1954, p. 2; Leuchtenberg, *Franklin D. Roosevelt and the New Deal, 1932-1940* (New York: Harper Torchbooks, 1965),

pp. 124-25; "Conchas Reservoir Project, New Mexico: Statement of Captain Lucius Clay, Chief of Engineers," 1 August 1935, Red River Valley Archives, Special Collections, University of New Mexico. [Hereafter cited as RRVA, SC, UNM.]

[13]*Albuquerque Journal,* 5, 8 Jaunary, 23 March 1935. Hurley had led the original 1925 Canadian River survey request, and his diligence on behalf of the project led Tingley to name him chairman of the Canadian River Commission.

[14]Ibid., 17 April, 24 May 1935.

[15]Donald C. Swain, "The Bureau of Reclamation and the New Deal, 1933-1940," *Pacific Northwest Quarterly* 61 (July 1970): 137-46; Leuchtenberg, *FDR and the New Deal,* pp. 70-71; Arch N. Hurley to A.W. Hockenhull, Governor of New Mexico, 27 September 1934; Hockenhull to Hurley, 29 September 1934, both in Conchas Dam Files, 1935-38, Clyde Tingley Papers, New Mexico State Records Center and Archives, Santa Fe. [Hereafter cited as NMSRCA.] Harold Ickes had known of the state's political and social environment for years. His wife maintained a summer cabin in the mountains of western New Mexico, near Coolidge. Mrs. Ickes wrote several books on the Indian cultures of the Southwest, and died in an automobile accident on New Mexico State Highway 68 in Velarde in the summer of 1935. Mrs. Ickes was returning from Taos to the annual Fiesta in Santa Fe at the time of the mishap.

[16]Hurley to Tingley, 18 May 1935; Telegram, Tingley to Harry L. Hopkins, Federal Emergency Relief Administration, New York City, 18 May 1935, both in Tingley Papers, NMSRCA.

[17]*Albuquerque Journal,* 5, 22, 23 June, 1, 8 July 1935. The work relief conflict broke when Harry Hopkins told the Chief of Engineers in July 1935 to spend less money on rivers and harbors work, and more on flood control. Hopkins earmarked $97 million to the Corps for public works projects, and requested that the bulk of the funds cover labor expenses.

[18]Telegram, Carl A. Hatch and Dennis Chavez, Washington, DC, to Tingley, 23 July 1935; "Resolution of the City Council of Tucumcari," 1 August 1935, both in Tingley Papers, NMSRCA; *Albuquerque Journal,* 1 August 1935.

[19]Albert K. Mitchell, Bell Ranch, New Mexico, to Julius G. Day, New Haven, Connecticut, 10 August 1935, RRVA, SC, UNM.

[20]Ibid.

[21]Ibid.

[22]Charles M. Botts, Albuquerque, to Day, 30 September 1935, RRVA, SC, UNM.

[23]*Albuquerque Journal,* 4, 5, 15 September 1935; Louis E. Stoddard, New York City, to Mitchell, 16 August 1935, RRVA, SC, UNM.

[24]Stoddard to Mitchell, 16 August 1935, RRVA, SC, UNM. Stoddard approached the ranch manager about the Conchas deal without informing his attorneys. He told Mitchell: "This letter is for your benefit, and perhaps might wisely be torn up."

[25]Telegram, Carl Hatch to Tingley, 28 August 1935; Tingley to Lyle T. Alverson, Solicitor, National Emergency Council, Washington, DC, 12 September 1935, both in Tingley Papers, NMSRCA; Seth to Stoddard, 11 September 1935, RRVA, SC, UNM.

[26]Mitchell to Day, 10 August 1935, RRVA, SC, UNM.

[27]Tingley to Frank C. Walker, Executive Director, National Emergency Council, 2 October 1935, Tingley Papers, NMSRCA; Botts to Day, 17 August 1935, RRVA, SC, UNM. Some of the contributors were small farmers who pledged

their homes and fields to Tingley's fund drive, believing that their lives would improve dramatically with construction of Conchas Dam.

[28]Tingley to Walker, 2 October 1935; Telegram, Franklin D. Roosevelt, Washington, DC, to Walker, n. d., both in Tingley Papers, NMSRCA.

[29]Tingley to Alverson, 9 October 1935; notes of telephone conversation, Tingley to Alverson, 15 October 1935; Telegram, Tingley to Wilbur Hawk, Amarillo, Texas, 10 October 1935, all in Tingley Papers, NMSRCA.

[30]Stoddard to Walker, 6 September 1935; Tingley to Walker, 28 October 1935, both in Tingley Papers, NMSRCA.

[31]Stoddard to Walker, 19 October 1935; General Edward M. Markham, Chief of Engineers, to Walker, 24 October 1935, both in Tingley Papers, NMSRCA.

[32]J.O. Seth and Charles M. Botts to Tingley, 1 November 1935; Arthur T. Hannett to Tingley, 4 November 1934, both in Tingley Papers, NMSRCA. The New Mexico State Supreme Court disliked the tone of the Bell Ranch brief, wherein lawyers for the ranch utilized "language critical of the court and its opinion heretofore announced." The wording was "unwarranted, impertinent, disrespectful and beyond the limits of proper criticism."

[33]Tingley to George H. Dern, Secretary of War, 1 November 1935; Brig. Gen. G. B. Pillsbury, Acting Chief of Engineers, to Tingley, 12 November 1935, both in Tingley Papers, NMSRCA.

[34]*Annual Report of the Chief of Engineers, U.S. Army, 1936,* p. 6 [hereafter cited as *Annual Report*].

[35]General Orders No. 9, Office of the Chief of Engineers [OCE], 31 July 1935, Office of Administrative Services [OAS], Albuquerque District.

[36]Interview with James S. Wilborn, 26 August 1983, Las Cruces, New Mexico.

[37]Wilborn interview; James A. Loughridge, "Surveyors of Conchas Dam (Part I)," *New Mexico Society for Professional Engineers,* 28 (November 1981): 12-13, 28.

[38]Loughridge, "Surveyors of Conchas Dam (Part II)," *New Mexico Society for Professsional Engineers,* 31 (December 1981): 18-19, 31; Lieutenant L. H. Foote, Corps of Engineers, "Conchas Dam Construction Camp," *The Military Engineer* (July-August 1937): 265-68.

[39]Capt. James H. Stratton, Tucumcari District, to Professor A.E. Douglass, University of Arizona, Tucson, 20 December 1935; Captain John R. Noyes, Tucumcari District, to Douglass, 25 January 1936; Albuquerque District Records, Box 188, Record Group 77, National Archives and Records Administration, Washington National Records Center. [Hereafter cited at RG 77, WNRC.]

[40]Foote, "Construction Camp," 265-66; Interview with Lonnie Horton, 8 September 1983, Tucumcari, New Mexico. Newkirk also became the scene of a lively social life for Conchas construction workers, with the town attracting many individuals familiar with a boomtown environment. Among its major assets was the Hillcrest Dance Hall, remembered by District retirees for its entertainment and rowdiness.

[41]Horton interview; Wilborn interview. Gate City received its name because of the many jobseekers camped out across the road from the entrance to the Conchas project. Oddly enough, the community of Hooverville did not derive its name from the camps of unemployed springing up nationwide in the Depression, but from a local doctor who served the area after World War II. [Interview with Mr. Lawrence South, Resident Manager, Conchas Dam, New Mexico, 23 August 1983.]

[42]"Emergency Relief Act Completion Report, Conchas Dam Project," 29 April

1937, Albuquerque District Records, Box 180, RG 77, Fort Worth Records Center [hereafter cited as FWRC]; Kramer to William Gallegos, Bernalillo, New Mexico, 25 November 1935; Colonel Hugh H. Milton, Jr., Dean, School of Engineering, New Mexico Agricultural College, to Tingley, 26 August 1935; Sesario Mascarenaz, et al., Tucumcari, to Tingley, 26 August 1935, all in Tingley Papers, NMSRCA. Among the methods used by the Corps to address the problem of unskilled labor was the establishment of trade "schools" at Conchas Dam. Narcisso Sandoval of Taylor Springs, New Mexico, wrote to Tingley seeking his help in entering the "Diesel Engineering School" at Conchas, which paid students while instructing them. [Narcisso Sandoval to Tingley, 9 January 1936, Tingley Papers, NMSRCA.]

[43]E.L. Grider, General Superintendent, Bent Brothers and Griffith, Inc., to Kramer, 6 November 1937; H. Stanley Bent to Kramer, 9 February 1938; Kramer to Bent, 12 February 1938; Memorandum, Kramer to Bent Brothers and Griffith, Inc., 12 November 1937, all in Albuquerque District File 160, Conchas Correspondence, Box 180, RG 77, FWRC. The mess hall situation was exacerbated by the crowded conditions at times of shift change, the delays in service, and the lack of sufficient quantities of food. Captain Kramer addressed this problem by hiring more staff and increasing the purchases of food. [Memorandum, O.G. Haywood, Jr., Second Lieutenant, Corps of Engineers, to Kramer, 9 November 1937, File 160, Conchas Correspondence, Box 180, RG 77, FWRC.]

[44]"District Conference Notes," 15 August 1937, Conchas Dam File, Albuquerque District Records, Box 184, RG 77, FWRC.

[45]Los Angeles [CA]*Herald-Examiner,* 24 October 1938, cited in Albuquerque Reprimand File, District File 230.745, Albuquerque District Records, Box 184, RG 77, FWRC. Kramer immediately wrote to U.S. Attorney Everett Grantham, seeking verification of the charges. "The quoted statement," said the captain, "contains invidious imputations which I am unable to understand." Grantham replied that he did not include the Army Engineers in his allegations, but that he did "have such statements from former WPA employees." [Kramer to Grantham, 31 October 1938; Grantham to Kramer, 3 November 1938, File 230.475, Albuquerque District Records, Box 184, RG 77, FWRC].

[46]Mr. and Mrs. Walter Giles, Bernalillo, New Mexico, to Tingley, 14 June 1935, Tingley Papers, NMSRCA.

[47]F. Rudolf Sotherland, Miami, New Mexico, to Dennis Chavez, 6 December 1935; Sotherland to Tingley, 16 December 1935, both in Tingley Papers, NMSRCA.

[48]Kramer to Tingley, 23 December 1935; George J. Lins, Tucumcari, to Tingley, 3 September 1935; Kramer to Tingley, 9 September 1935, all in Tingley Papers, NMSRCA.

[49]Circular No. 70 (Concessions No. 1): "Information Regarding Business Concessions at Conchas Dam," 26 February 1935, Tingley Papers, NMSRCA.

[50]Foote, "Construction Camp," 266; Horton interview; Circular No. 130 (Concessions No. 6): "Motion Picture Theatre Concession at Conchas Dam," 24 August 1936, Tingley Papers, NMSRCA.

[51]Foote, "Construction Camp," 268.

[52]Mattie Ellis, "Notes on the School at Conchas Dam," 1983, Personal Papers of Mattie Ellis, Conchas, New Mexico; Kramer to Tingley, 26 November 1935, 8 December 1936, Tingley Papers, NMSRCA; Kramer to L.T. Grider, 27 September 1937, Albuquerque District Records, Box 184, RG 77, FWRC. In 1940

the high school closed its doors with completion of the dam, and the grade school reverted to a one-room operation serving the children of the Corps personnel and employees of the state of New Mexico working at Conchas Lake.

[53]Telegram, Kramer to John D. Bingaman, Commissioner of Revenue, State of New Mexico, 10 August 1937; Kramer to Tingley, 4 August 1937; Kramer to Grantham, 27 July 1937, all in Tingley Papers, NMSRCA.

[54]"Recreation Room and Dormitory Regulations," File Memorandum, Jack L. Coan, Second Lieutenant, Corps of Engineers, Town Manager, Conchas, New Mexico, 18 February 1938, Regulations and Conduct Files, Albuquerque District Records, Box 341, RG 77, FWRC; Kramer to Tingley, 26 February 1938, Tingley Papers, NMSRCA.

[55]H. S. Cummings, Surgeon General, Public Health Serivce, to Major General Edward M. Markham, 6 September 1935, Albuquerque 721 Sanitation File; Kramer to the Chief of Engineers, 11 July 1936, Albuquerque 701 Medical Attention File; "Health Care Conference, 4 Novemebr 1937," Conference File, all in Albuquerque District Records, Box 184, RG 77, FWRC.

[56]Brig. Gen. G. B. Pillsbury, Acting Chief of Engineers, Circular Letter, "Work to be executed under Relief Program," 2 October 1935, WPA Circular Letters File, Albuquerque District Records, NA-342, RG 77, WNRC.

[57]"Inspection of Dams in New Mexico and Arizona," 26 June 1936, Albuquerque Dam Inspection File No. 821.2, Albuquerque District Records, Box 341, RG 77, FWRC. The District sent four members of its Design Section to inspect Bureau of Reclamation projects in New Mexico and Arizona during the spring of 1936. These included Elephant Butte Dam on the Rio Grande, Coolidge Dam on the Gila River, Roosevelt Dam on the Salt River, and Parker and Boulder Dams on the Colorado River. These reports consisted primarily of technical analyses of the stuctures and their capabilities. Boulder Dam, considered the epitome of New Deal public works, did strike the Tucumcari Engineers as a masterpiece: "The dam itself with its symmetry, plain surfaces, and shadows presented a very beautiful sight and blended in well with the massive canyon walls. The lighting was very modernistic. The roadway lights on top of the dam were recessed in the side of the parapet walls. The intake towers were floodlighted with bulls eye lights set into the top of the parapet wall, presenting an artistic appearance at night."

[58]Brig. Gen. Eugene Reybold, Division Engineer, Southwestern Division [SWD], to the Chief of Engineers, 20 September 1937, Albuquerque District Organization File 310.1, Albuquerque District Records, Box 341, RG 77, FWRC.

[59]Kramer to Reybold, 23 September 1937, File 310.1, Albuquerque District Records, Box 341, RG 77, FWRC.

[60]"Notes on conference regarding extension of the Conchas District," 18 May 1939, File 310.1, Albuquerque District Records, Box 341, RG 77, FWRC. Kramer had informed the Division before broaching the subject to his staff that "this District will take over the new work in its present stride without any great influx of new employees." The captain would consider "any application for transfer initiated by the employees themselves to be most unusual under the circumstances." He realized that the new Tulsa District would open in June 1939 but that any appeals for recruitment at Conchas would be rejected.

[61]"Report on Conchas Dam," April 1954, Mueller Papers.

[62]Kramer to Hatch, 28 March 1939; Edwin M. Watson, Secretary to the President of the United States, to John E. Miles, Governor of New Mexico, 19 July 1939; Kramer to Miles, 18 September 1939, all in Governor John E. Miles Pa-

pers, NMSRCA.

[63]Mitchell to Seth, 27 August 1936; Stoddard to Seth, 21 February 1939, both in RRVA, SC, UNM.

[64]State of New Mexico ex rel. State Game and Fish Commission v. Red River Valley Improvement Company, 51 N.M. 207, New Mexico Reports, January Term 1947.

[65]Interview with Mrs. Hans T. Kramer, 27 December 1983, San Mateo, California.

[66]*Annual Report, 1940,* pp. 1057-59.

III

[1]Carl Abbott, et al., *Colorado: A History of the Centennial State.* (Boulder: University of Colorado Press, 1982), pp. 160-172.

[2]Dunbar, *Forging New Rights,* pp. 76-78.

[3]M. C. Hinderlider, "History of the Caddoa Reservoir Project," Arkansas River 1925-1934 File, Office of the State Engineer, Denver, Colorado [hereafter cited as OSE]; Abbott, *Colorado,* pp. 171-72.

[4]Elwood Mead, Commissioner, Bureau of Reclamation, to Hinderlider, 27 April 1926, Arkansas River 1925-1934 File, OSE.

[5]R. J. Tipton, "Arkansas River Water Resources Study," 1 July 1931, John Martin Reservoir File, OSE.

[6]Interview with Gordon Allott, 30 August 1983, Denver, Colorado; Interview with J. Edgar Chenoweth, 2 September 1983, Trinidad, Colorado. Congressman Martin's career from 1933 to 1939 is shrouded in mystery, as contemporaries recall his terms in office as dedicated only to the construction of Caddoa Dam.

[7]"Application of the State of Colorado for the Construction of the Caddoa Reservoir," 1933, John Martin Dam File, Albuquerque District Records, Box 173, RG 77, FWRC; Kramer to the Chief of Engineers, 27 September 1939, John Martin File, Albuquerque District Records, Box 182, RG 77, FWRC.

[8]"Caddoa Reservoir Application," OSE; James F. Wickens, "The New Deal in Colorado," *Pacific Historical Review,* 38 (August 1969): 275-92.

[9]"Caddoa Reservoir Application," OSE.

[10]John Martin to Hinderlider, 21 July 1933, OSE.

[11]"Caddoa Reservoir Application," OSE. Hurley served two masters on the Arkansas Basin Committee, since his primary concern was funding for Conchas Dam in New Mexico.

[12]Martin to Hinderlider, 25 August 1933, OSE.

[13]"Report on the Caddoa Dam and Reservoir Project," Arkansas Basin Committee, John Martin Dam File, Albuquerque District Records, Box 173, RG 77, FWRC.

[14]"Caddoa Reservoir Application;" Hinderlider to Arthur C. Gordon, Lamar, Colorado, and Miss Vena Pointer, Pueblo, 13 December 1933, OSE.

[15]"Memorandum of Conference between Major Carey H. Brown, Secretary of the Mississippi Valley Committee, M. C. Hinderlider, and Chester I. Long," 14 March 1934, OSE. Long was a former U.S. Senator from Kansas who worked closely with the Caddoa supporters in Colorado. His participation signalled the approval of his state in the negotiations over distribution of the flow of the Arkansas River.

[16]"Caddoa Reservoir Application," OSE.

[17]Henry C. Vidal to Chester I. Long, 19 February 1934, OSE.

[18]*Albuquerque Journal,* 19 January 1935; Vidal to Herbert S. Crocker, Washington, DC, 1 February 1935, OSE.

[19]*Albuquerque Journal,* 19 January, 22 April, 27 May, 23 June 1935. The Albuquerque paper carried several stories about pleas for Caddoa Dam in 1935 for two reasons. Many southern Coloradoans had more affinity with New Mexico, due to their geographic and cultural similarity, than with the capital city of Denver. In addition, New Mexico kept a close watch on the progress of Caddoa Dam, concerned that it not outdistance the prospects for Conchas Dam.

[20]Telegram, Hinderlider to Major General Edwin Markham, Chief of Engineers, 21 September 1935, OSE.

[21]Hinderlider to Edwin C. Johnson, 28 September 1935; Telegram, Hinderlider to Johnson, 25 September 1935, both in OSE. The state engineer had had more bad news for the Colorado governor concerning to federal projects. Not only had Caddoa Dam met defeat, but plans to conduct drilling at the proposed site were rejected "for a lack of a proper sponsor." The proposal to divert water from the west slope of the state to the Arkansas River, then called the "Taylor River-Arkansas Valley Transmountain project," asked for $150,000 to conduct a feasibility study. Secretary of the Interior Harold Ickes never read the report and thus gave it no attention. The "Expeditor" of the Colorado projects in Washington, a "Mr. Dawson," glumly informed Hinderlider that "no further funds [were] available for the numerous conservation projects in Colorado." [Hinderlider to Johnson, 28 September 1935, OSE.]

[22]Hinderlider to Arthur Dean, Las Animas, Colorado, 26 September 1935, OSE.

[23]Hinderlider to Edwin C. Johnson, Alva Adams, Edward Costigan, and John Martin, 29 October 1935, OSE.

[24]Flood Control Act of 22 June 1936, Public Law 74-738, 74th Congress, 2nd session, *Congressional Record,* pp. 1577, 1592.

[25]S. L. Scott, Lt. Col., District Engineer, Little Rock District, to the Chief of Engineers, 9 February 1939, John Martin Dam File, Albuquerque District Records, Box 182, RG 77, FWRC; Circular No. 4 (Information No. 1): "Information Concerning the Caddoa Dam and Reservoir Project," 1 January 1940, Caddoa District, U.S. Army Corps of Engineers, Historical Division, OCE, Research Collections, Fort Belvoir, VA.

[26]"Notes on Conference Regarding Extension of the Conchas District," 11 May 1939, Albuquerque 310.1 District Organization File, Albuquerque District Records, Box 341, RG 77, FWRC.

[27]*Annual Report, 1940,* pp. 1000-1002.

[28]Interview with Russell Smith, Resident Manager, John Martin Dam and Reservoir, 2 September, 1983; Mrs. Hans T. Kramer interview.

[29]Chenoweth interview; Allott interview; John A. Martin to Colonel Eugene Reybold, Division Engineer, 23 June 1939; Reybold to Martin, 28 June 1939, both in John Martin Dam-Comments File, Albuquerque District Records, Box 181, RG 77, FWRC; *Annual Report, 1940,* p. 1000.

[30]Arthur C. Gordon to Chenoweth, 23 August 1941, Caddoa Dam File, Box 2, Chenoweth Papers, Western History Collection, University of Colorado, Boulder [hereafter cited as WHC, UC]. Gordon served as attorney for the Fort Lyon Corporation, one of the two major groups of irrigators in the Arkansas valley. The other organization was the Amity Mutual Irrigation Company, whose lawyer was Gordon Allott. These two individuals maintained a thriving joint practice in Lamar in the 1930s and 1940s, and were among the most staunch supporters of John Martin Dam.

[31]Clifford Stone to Edwin C. Johnson, 7 January 1941; Frank S. Hoag to Chenoweth, 1 February 1941; Gordon to Chenoweth, 22 March 1941, all in H.R. 1823 Arkansas Valley Authority Act File, Box 3, Chenoweth Papers, WHC, UC.

[32]Abbott, *Colorado,* p. 277; *Annual Report, 1943,* pp. 849-51; Mary Farley, "Colorado and the Arkansas Valley Authority," *The Colorado Magazine* 48 (Summer 1971): 221-34.

[33]Chenoweth to Vena Pointer, Secretary, Caddoa Dam Board, Pueblo,10 May

1944, Caddoa Dam File, Box 2, Chenoweth Papers, WHC, UC.

[34]*Annual Report, 1949,* pp. 1210-12; Chenoweth interview.

[35]Norris Hundley, *Water and the West* (Los Angeles: University of California Press, 1975), pp. 74-76, 182-214.

[36]Mrs. Hans T. Kramer interview.

[37]"An Act to grant the consent of the United States to the Arkansas River Compact," 31 May 1949, Public Law 81-82, 81st Congress, 1st session,pp. 145-52.

[38]T. M. Lynch, Colorado Fish and Game Department, "The Fishery and Recreational Value of a Permanent Conservation Pool for John Martin Reservoir," 30 March 1960, Allott Papers, WHC, UC; Ivan C. Rumsey, Lieutenant Colonel, Executive Officer, to OCE, 15 July 1948, Albuquerque Civil Works FY 50 File, Albuquerque District Records, Box 216, RG 77, FWRC.

[39]*Congressional Record,* 89th Congress, 1st session, 19 October 1965, Volume 111, No. 195. Allott had his remarks on the permanent pool debate reprinted to distribute to his constituents.

[40]Lynch, "Permanent Conservation Pool," Allott Papers, WHC, UC.

[41]Allott to Fred M. Betz, Editor, *Lamar Daily News,* 24 March 1960, Public Works/John Martin File, Allott Papers, WHC, UC.

[42]House Resolution 9522, "A Bill to authorize the modification of the John Martin Reservoir project," 19 December 1963, 88th Congress, 1st session; *Pueblo Star-Journal,* 26 February 1964; *Pueblo Chieftan.* 27 September 1963; J. W. Penfold, Conservation Director, Izaak Walton League of America, to G. E. Kinble, Southeastern Colorado Recreational Association, Swink, Colorado, 29 August 1963, Public Works/John Martin File, Allott Papers, WHC. UC.

[43]*Annual Report, 1966,* U.S. Congress, House, H.Doc. 4, Part 1, 90th Congress, 1st session, pp. 746-47; Smith interview.

[44]*Denver Post,* 23 September 1965; Chenoweth interview.

[45]Robert Dole to U.S. Congressman Don H. Clausen, House Subcommittee on Public Works, 31 August 1965, Allott Papers, WHC, UC.

[46]Clinton P. Anderson to U. S. Senator Pat McNamara, 24 August 1965, Public Works/John Martin File, Allott Papers, WHC, UC.

[47]*Annual Report, 1966,* pp. 746-47.

[48]Smith interview; Interview with Richard Blum, 27 June 1984, Placitas, New Mexico.

IV

[1]Nash, *American West in the Twentieth Century,* pp. 195-212. Also see Nash, *The American West Transformed: The Impact of the Second World War* (Bloomington: Indiana University Press, 1985).

[2]"History of Authorizations, Organizations and Responsibilities," Albuquerque District File No. 228.01, OAS, Albuquerque District; *Annual Report, 1942,* p. 934; Louis C. Tulga, *The First Thirty-Six Years: A History of the Albuquerque District, 1935-1971* (Albuquerque, 1972), p. 20.

[3]Richard Polenberg, *War and Society: The United States, 1941-1945* (New York: J. B. Lippincott, 1972), pp. 5-37.

[4]Tulga, *Thirty-Six Years,* p. 20.

[5]L. E. Cox, Captain, Corps of Engineers, Assistant Engineer, Caddoa District, to Division Engineer, SWD, 30 October 1941; Horace M. Albright, Vice President and General Manager, U. S. Potash Company, New York City, to Thomas H. McDonald, Commissioner, Public Roads Administration, Washington, DC, 16 December 1941, both in Albuquerque 611 Roads File, Albuquerque District Records, Box 341, RG 77, FWRC.

[6]"History of the Albuquerque District," File No. 228.01, OAS, Albuquerque District; Tulga, *Thirty-Six Years,* p. 20.

[7]Circular No. 82 (Personnel No. 52), Major Lyle Rosenberg, "Transfer of District Office to Albuquerque, New Mexico," 29 December 1941, File No. 228.01, OAS, Albuquerque District.

[8]David W. Parsons, Assistant Engineering Chief, Memorandum, "Additional Military Construction in Arizona," 30 December 1941; Rosenberg, Memorandum, "Record of Telephone Conversation with Colonel [S. L.] Scott," 23 December 1941, both in Albuquerque 600.12 File, Albuquerque District Records, Box 341, RG 77, FWRC.

[9]Tulga, *Thirty-Six Years,* pp. 20-21; Marc Simmons, *Albuquerque: A Narrative History* (Albuquerque: University of New Mexico Press, 1982), pp. 366-67; Wilborn interview.

[10]Office of the Chief of Engineers, Military Programs Report, 30 April, 15 May 1942, Military Construction Files, Historical Division, OCE.

[11]Lenore Fine and Dr. Jesse Remington, *Construction in the United States: World War II* (Washington: U.S. Government Printing Office, 1970), pp. 623-24; Mrs. Hans T. Kramer interview.

[12]Fine and Remington, *Construction in the U.S.,* pp. 640-41.

[13]J. E. Anderson, Mayor, El Paso, Texas, to Rosenberg, 12 May 1943, Biggs Airfield Files, Airfield Records, USAF Historical Research Center, Maxwell AFB, AL. [Hereafter cited as USAF, HRC, Maxwell AFB.] Critical water shortages extended to the need for fire protection at airbases, and treatment of sewage for hundreds of residents in the El Paso area.

[14]"Exhibit A, Site Data," 9 February 1942, Clovis Airfield Files, USAF, HRC, Maxwell AFB.

[15]A. W. Anderson, Secretary, Clovis Chamber of Commerce, to Captain T. A. Krauel, Eighth Service Command, Dallas, Texas, 14 December 1942, Clovis Airfield Files, USAF, HRC, Maxwell AFB. Adding to Clovis' predicament was the increase of Santa Fe Railway activity to meet the building boom at the nearby airfield. Three hundred railroad employees arrived in Clovis in the summer of

1942, all competing for the same housing facilities as the District personnel and the laborers of its contractors.

[16]Telegram, Colonel S. L. Scott to the Chief of Engineers, 16 September 1942, Carlsbad Airfield Files; W. D. Styer, Brig. Gen., General Services Commission, to R. E. Thomason, House of Representatives, 26 May 1942, Biggs Airfield Files, USAF, HRC, Maxwell AFB; *El Paso [TX] Herald Post,* 8 May 1942.

[17]Memorandum, Henry B. Lavery, Lieutenant Colonel, Medical Corps, to the Commanding Officer, Deming Airfield, 11 July 1944; Memorandum, H. H. Dunham, Major, Corps of Engineers, Military Construction Branch, OCE, to Southwestern Division Engineer, 13 December 1944, Deming Airfield Files, USAF, HRC, Maxwell AFB; John J. Culley, "World War II and a Western Town: The Internment of the Japanese Railroad Workers of Clovis, New Mexico," *Western Historical Quarterly* 13 (January 1982): 43-61.

[18]R. H. Faxon, Secretary, Raton Chamber of Commerce, to John E. Miles, Governor of New Mexico, 14 August 1940; Miles to Faxon, 15 August 1940, both in Governor John A. Miles Papers, NMSRCA.

[19]Tulga, *Thirty-Six Years,* p. 22; Chenoweth interview; Redmond interview.

[20]Polenberg, *War and Society,* pp. 60-61.

[21]Tulga, *Thirty-Six Years,* pp. 22-23; Polenberg, *War and Society,* pp. 64-72.

[22]Fine and Remington, *Construction in the U.S.,* pp. 663-65.

[23]"Albuquerque District Participation in Construction of the Los Alamos Laboratory," File No. 228-01, Correspondence, OAS, Albuquerque District; Fine and Remington, *Construction in the U.S.,* pp. 664-65.

[24]Questionnaire of Dr. Jesse Remington to James A. Loughridge, 5 July 1968, File No. 228-01, Correspondence, OAS, Albuquerque District; Fine and Remington, *Construction in the U.S.,* pp. 695-97.

[25]Fine and Remington, *Construction in the U.S.,* p. 697. McKee and Company would remain at Los Alamos after the war to provide support services under a subsidiary known as the Zia Company. For a description of those early activities, see Robert McKee, *The Zia Company* (El Paso, 1950).

[26]Fine and Remington, *Construction in the U.S.,* p. 696.

[27]"Albuquerque District Participation;" Loughridge Questionnaire.

[28]Interview with Samuel P. Davalos, 13 August 1983, Santa Fe, New Mexico; John J. Dempsey, Governor of New Mexico, to Henry L. Stimson, Secretary of War, 27 January 1943, Defense Area File, Governor John J. Dempsey Papers, NMSRCA.

[29]Wilborn interview; Telegram, C. L. Knight, Chairman, Mesilla Valley Chamber of Commerce, Las Cruces, New Mexico, to Dempsey, 24 November 1942, Dempsey Papers, NMSRCA.

[30]R. G. Walker, Chairman, Board of County Commissioners, Otero County, Alamogordo, New Mexico, to Dempsey, 5 October 1942, Dempsey Papers, NMSRCA.

[31]Telegram, Carl A. Hatch to Dempsey, 4 December 1942; Stimson to Dempsey, 8 January 1943, both in Defense Area File, Dempsey Papers, NMSRCA.

[32]Dempsey to Stimson, 27 January 1943, Defense Area File, Dempsey Papers, NMSRCA.

[33]Davalos interview; Ferenc M. Szasz, *The Day the Sun Rose Twice* (Albuquerque: University of New Mexico Press, 1984), pp. 29-30.

[34]Davalos interview.

[35]Szasz, *Sun Rose Twice,* p. 32; *Albuquerque Journal,* n. d. 1983. As a result of the publicity achieved by McDonald upon his return to the Trinity site in Oc-

tober 1982, the Federal Lands Commission agreed to hear his case. McDonald argued that the Bureau of Land Management allowed 440 cattle to graze annually on acreage similar to his prewar ranch. His own lands were worth $900-$1,000 per acre, he contended, and the 81-year-old stockman sought full reimbursement for 40 years of lost income. The panel reminded McDonald that he had received from the Army $35,200 for each of his two tracts in 1980, and then awarded him an additional $53,000 for his latest claim.

[36]Davalos interview; Szasz, *Sun Rose Twice,* pp. 34-37.

[37]Szasz, *Sun Rose Twice,* p. 37.

[38]Ibid.

[39]Ibid., pp. 38-40.

[40]Fine and Remington, *Construction in the U.S.,* pp. 700-701.

V

[1]"Office of the Chief of Engineers, Military Construction Programs," 31 January 1946, pp. 71, 79, 82, Historical Division, OCE; Wilborn interview; Loughridge interview.

[2]Loughridge interview; Tulga, *Thirty-Six Years,* p. 32.

[3]Tulga, *Thirty-Six Years,* p. 33.

[4]George Mahon to Colonel Charles H. McNutt, District Engineer, 10 January 1951; McNutt to Mahon, 15 January 1951, both in 323.3 Albuquerque File, Volume 4, Albuquerque District Records, Box 223, RG 77, FWRC.

[5]"Albuquerque Bombs Build Boomtown," *Business Week,* 13 May 1950. For a discussion of Albuquerque's growth in relation to defense spending, see Howard N. Rabinowitz, "Albuquerque: City at a Crossroads," in Richard M. Bernard and Bradley R. Rice, eds. *Sunbelt Cities: Politics and Growth since World War II* (Austin: University of Texas Press, 1983), pp. 255-67. Also see Bradford Luckingham, *The Urban Southwest: A Profile History* (El Paso: University of Texas at El Paso Press, 1982), pp. 79-94.

[6]Memorandum of F. O. Reeves, Chief, Engineering Division, Albuquerque District, to Headquarters, 47th Air Division, Walker Air Force Base, Roswell, New Mexico, 7 January 1955; William F. Turney, Santa Fe, to Hollis A. Norine, Albuquerque District, 3 July 1954, both in 231.2 Albuquerque Architecture and Construction Engineers January-December 1954 File, Albuquerque District Records, Box 155, RG 77, FWRC.

[7]R. C. Phillips, Jr., President, Airways Engineering Corporation, to Colonel Lynn C. Barnes, Albuquerque District Engineer, 6 July 1953, 231.2 Albuquerque Volume II Architecture and Construction Engineers January-December 1953 File, Albuquerque District Records, Box 155; J. W. Desmond, Manager, Government Projects Department, Henry J. Kaiser Company, Oakland, California, to Colonel Albert L. Reed, Albuquerque District Engineer, 4 December 1958, 337 Albuquerque Conference January 1, 1958 File, Albuquerque District Records, Box 147, RG 77, FWRC.

[8]Dennis Chavez to Barnes, 5 October 1953; Robert G. Goodwin to Chavez, 24 September 1953, both in 231.2 Albuquerque Volume I Architecture and Consulting Engineers January 1-December 31, 1953 File, Albuquerque District Records, Box 155, RG 77, FWRC.

[9]Clinton P. Anderson to Barnes, 6 October 1953, 231.2 Albuquerque Volume I Architecture and Consulting Engineers January 1-December 31, 1953 File, Albuquerque District Records, Box 155, RG 77, FWRC.

[10]Coleman L. Hasie, Lubbock, Texas, to Barnes, 6 October 1953, 231.2 Albuquerque Volume I Architecture and Consulting Engineers January 1-December 31, 1953 File, Albuquerque District Records, Box 155, RG 77, FWRC.

[11]Robert R. Granville, Executive Director, President's Committee on Government Contract Compliance, to John D. Small, Chairman, The Munitions Board, Department of Defense, 9 July 1952, Albuquerque Military Volume 10 File (1952), Albuquerque District Records, Box 217, RG 77, FWRC.

[12]Vance Newell, Manager, Texas Highway Branch, Associated General Contractors, to McNutt, 17 September 1952, Albuquerque Military 248.3 (1952-1953) File, Albuquerque District Records, Box 219, RG 77, FWRC; Barnes to Representative John J. Dempsey, 9 October 1954; Telegram, Joe Bermudez to

Dempsey, 1 October 1954; Telegram, James A. Price to Dempsey, 1 October 1954; Telegram, C. F. McNabb, Secretary and Business Agent, El Paso Building Trades Council, to Dempsey, 1 October 1954, all in John J. Dempsey Personal Papers, NMSRCA.

[13]Charles J. Pipkin to Senator Eugene D. Milliken, Denver, Colorado, 12 February 1952; Memorandum, Colonel Jackson Graham, Acting Assistant Chief of Engineers for Personnel and Administration, 14 March 1952, "Complaint of Employees of the District Engineer, Albuquerque, Regarding Reduction in Force," Albuquerque Volume 4 320.83 (1951-52) File, Albuquerque District Records, Box 219, RG 77, FWRC.

[14]Memorandum, F. O. Reeves, Chief, Engineering Division, Albuquerque District, 6 March 1952, Albuquerque Military 230.437 (1952) File, Albuquerque District Records, Box 219; Lieutenant General Lewis A. Pick, Chief of Engineers, to Colonel Herbert D. Vogel, Division Engineer, 29 October 1952, Albuquerque Overseas Military (1952) File, Albuquerque District Records, Box 217, RG 77, FWRC.

[15]Brig. Gen. J. S. Seybold, Assistant Chief of Engineers for Personnel and Administration, to Colonel Lewis W. Prentiss, Division Engineer, 12 March 1952, Albuquerque 336 (1952) File, Albuquerque District Records, Box 223, RG 77, FWRC.

[16]Lt. Col. Herbert N. Turner, Acting District Engineer, to Cadet Cary B. Hutchinson, West Point, New York, 14 May 1952, Albuquerque 336 (1952) File, Albuquerque District Records, Box 223, RG 77, FWRC.

[17]Memorandum, Barnes to the Office of the Chief of Engineers, 25 August 1953, Albuquerque Volume 320 (1951-1952) File, Albuquerque District Records, Box 223, RG 77, FWRC.

[18]Personnel Kit Bulletin, "Organizations Designated as Totalitarian, Fascist, Communist or Subversive," 1 June 1955, Albuquerque Inspection File, Albuquerque District Records, Box 198, RG 77, FWRC.

[19]Memorandum, Colonel Turner, "Standards of Conduct," 24 September 1952, Albuquerque Loyalty File (1951-1952), Albuquerque District Records, Box 219; Memorandum, M. R. Howard, Project Engineer, Sandia Base Suboffice, "Rules and Policies Affecting the Personal Conduct of All Officers and Employees of the Corps of Engineers," 25 September 1952, Albuquerque Military 210 (1952) File, Albuquerque District Records, Box 217, RG 77, FWRC.

[20]Memorandum, Colonel A. C. Welling, OCE, "List of Citizens (Reports Control Symbol ENGGI-1-501)," 23 June 1955, Albuquerque Inspections File, Albuquerque District Records, Box 198, RG 77, FWRC.

[21]Barnes to Colonel Lyle Seeman, Division Engineer, 20 June 1955, Albuquerque Inspections File, Albuquerque District Records, Box 189, RG 77, FWRC.

[22]Robert E. Rightmeyer to Colonel Robert E. Cron, Jr., Albuquerque District Engineer, 24 September 1956; Memorandum to Frank O. Reeves, Resident Engineer, Fort Bliss, Texas, "Investigation of Construction by Rightmeyer Congressional Committee, House Committee on Appropriations," 6 November 1956; Record File, "Visit of Investigative Staff, House Committee on Appropriations to the Albuquerque District," 10 December 1956; "Information requested on addenda to bid invitations by investigative staff," 30 October 1956, all in 333.1 Albuquerque Visiting of Investigation Staff File, Albuquerque District Records, Box 148, RG 77, FWRC.

[23]Military Construction Appropriations (1959), 85th Cong., 2nd Sess., House and Senate Hearings, pp. 716-17.

[24]Ibid., pp. 906-11.

[25]Telegram, Albuquerque District Engineer to OCE, 24 June 1959, Fort Bliss Inspection File, Albuquerque District Records, Box 197, RG 77, FWRC.

[26]Tulga, *Thirty-Six Years,* p. 41.

[27]*Ibid.*, pp. 41-42.

[28]Chenoweth interview.

[29]Tulga, *Thirty-Six Years,* pp. 42-43.

[30]"Experience and Capabilities of the Albuquerque District for Performing NASA Design and Construction Projects," File No. 1505-11, Albuquerque District Records, Box 12, RG 77, WNRC.

[31]"Apollo Tests at White Sands," *Missiles and Rockets,* 17 September 1962; Memorandum of Colonel John F. Arfman, Albuqerque District Engineer, to SWD, "Progress of Apollo Facilities NASA-MSC/WSMR," 12 April 1963, both in File No. 1505-11, Albuquerque District Records, Box 12, RG 77, WNRC.

[32]"Flight Center Said Leaving Florida," *Las Cruces Sun,* 2 April 1963.

[33]Memorandum, Arfman, 12 April 1963, File No. 1505-11, Albuquerque District Records, Box 12, RG 77, WNRC.

[34]Lt. Col. William P. Gardiner, OCE Liaison Officer, White Sand Missile Range, "Monthly Activity Report," 1 June 1963, File 1505-11, Albuquerque District Records, Box 12, RG 77, WNRC.

[35]"Conference: Review of Lunar Excursion Module (LEM) Propulsion Test Facility Criteria," 27 May 1963, File No. 1505-11, Albuquerque District Records, Box 12, RG 77, WNRC; "$15 Million White Sands Test Unit Near Completion," *Albuquerque Journal,* 21 August 1964.

[36]Wilborn interview.

[37]Blum interview; Tulga, *Thirty-Six Years,* pp. 44-45.

[38]Brown interview; James D. Clayton, *The Economic and Social Impact of the Cold War* (New York, 1962).

[39]Tulga, *Thirty-Six Years,* p. 653; Blum interview; Loughridge interview.

[40]Telegram, Albuquerque District Employees to Richard M. Nixon, 21 March 1970, Corps of Engineers Files, Governor David M. Cargo Papers, NMSRCA.

[41]U.S. Army Corps of Engineers Employees to David M. Cargo, 30 March 1970, Corps of Engineers Files, Governor David M. Cargo Papers, NMSRCA.

[42]Telegram to Richard M. Nixon; "Narrative Comments on Chart Showing Estimated Personnel Gains and Losses in Defense Oriented Installations," Corps of Engineers Files, Governor David M. Cargo Papers, NMSRCA.

[43]Henry G. Maez to Cargo, 25 March 1970, Corps of Engineers Files, Governor David M. Cargo Papers, NMSRCA.

[44]Maez to Cargo, 25 March 1970, Corps of Engineers Files, Governor David M. Cargo Papers, NMSRCA.

[45]Ellis H. Easley to Fabian Chavez, Jr., 15 February 1970, Corps of Engineers Files, Governor David M. Cargo Papers, NMSRCA.

[46]Easley to Chavez, 15 February 1970, Corps of Engineers Files, Governor David M. Cargo Papers, NMSRCA.

VI

Portions of Chapter VI appear in altered form in the July 1985 issue of the *New Mexico Historical Review* by permission of the University of New Mexico Board of Regents.

[1]"Upper Rio Grande Basin," 1948 Report, Rio Grande Basin Files, New Mexico State Engineers Office, Santa Fe. [Hereafter cited as RGB, SEO.] An overview of federal water policy planning in the West in the 1930s is contained in Richard Lowitt, The New Deal and the West (Bloomington: Indiana University Press, 1984), 81-99. For an assessment of the origins of the interstate stream compact system, see Hundley, *Water and the West.*

[2]"Upper Rio Grande Basin," 1948 Report, pp. 6-7.

[3]"Water Use and Water Control Planning on the Rio Grande," 1956 Report, RGB, SEO; Interview with Jesse Gilmer, Rio Grande Compact Commissioner for Texas, 8 September 1983, El Paso, Texas; Interview with Subhas K. Shah, Chief Engineer, Middle Rio Grande Conservancy District [MRGCD], 20 March 1984, Albuquerque, New Mexico; Telegram, Colonel L. H. Hewitt, District Engineer, Galveston District, to John T. Varney, Secretary, MRGCD, 8 December 1941; Stanley Phillippi, Chief Engineer, MRGCD, to Hewitt, 10 December 1941, all in Middle Rio Grande Conservancy District Records, Albuquerque, New Mexico [Hereafter cited as MRGCD].

[4]Shah interview.

[5]Albert G. Simms, President, Board of Commissioners, MRGCD, to Lieutentant Ruben E. Cole, District Engineer, Albuquerque District, 8 February 1944, MRGCD Records.

[6]Clinton P. Anderson to Phillippi, 19 March 1941, Conservancy File, Governor John E. Miles Papers, NMSRCA.

[7]Gordon Gray, Undersecretary of the Army, to the Speaker of the U. S. House of Representatives, 10 June 1948, "Rio Grande And Tributaries, New Mexico," 1949 Study, U.S. Army Corps of Engineers, U.S. Congress, House, H.Doc. 243, 81st Cong., 1st sess.; Fred E. Wilson, Board of Commissioners, MRGCD, to John J. Dempsey, 1 May 1945, RGB, SEO. The compromise reached by the Bureau of Reclamation and the Corps in the Missouri River basin came to be known as the "Pick-Sloan Plan," named for the Chief of Engineers and a representative of the Bureau. For an analysis of this controversy, see Michael Lawson, *Dammed Indians: The Pick-Sloan Plan and the Missouri River Sioux, 1944-1980* (Norman: University of Oklahoma Press, 1982).

[8]Elmo Richardson, *Dams, Parks and Politics: Resource Development and Preservation in the Truman-Eisenhower Era* (Lexington: University Press of Kentucky, 1973), 4-5.

[9]Oscar M. Love to Clinton Anderson, 28 March 1945; Wilson to Dempsey, 1 May 1945, both in RGB, SEO.

[10]Clifford H. Stone, Director, Colorado Water Conservation Board, to Anderson, n.d., RGB, SEO.

[11]Terrell Bartlett, San Antonio, Texas, to Thomas McClure, New Mexico State Engineer, 21 August 1945, RGB, SEO.

[12]Anderson to McClure, 30 March 1945, RGB, SEO.

[13]Gilmer interview; Interview with David M. Cargo, Governor of New Mexico

[1967-1971], 26 September 1983, Portland, Oregon.

[14]Thomas Nickerson, Administrative Assistant, United Pueblos Agency, Bureau of Indian Affairs, Albuquerque, to Colonel Cole, 11 April 1945; Cole to Nickerson, 25 April 1945, both in File No. 800.12, Box 1, Albuquerque District Records, RG 77, FWRC.

[15]"Bridges Pledges Co-operation in Flood Protection," *Albuquerque Tribune,* 2 November 1946.

[16]Frank Pace, Jr., Director, Bureau of the Budget, to the Secretary of the Army, 12 April 1946; Lee Knous, Governor of Colorado, to Kenneth C. Royall, Secretary of the Army, 29 March 1948, both in "Rio Grande and Tributaries, NM," 27 June 1949, H.Doc. 243, 81st Cong., 1st sess.

[17]Pace to Royall, 12 April 1949; Knous to Royall, 29 March 1948, both in H.Doc. 243, 81st Cong., 1st sess.

[18]Loughridge interview, 21 March 1948, Albuquerque, New Mexico; Brown interview; Paul A. Wilson, Chief, Engineering Division, Albuquerque District, to the Chief of Engineers, Washington, DC, 31 December 1946, File No. 800.12, Box 1, Albuquerque District Records, RG 77, WNRC.

[19]"Senator Chavez to Ask $1.375 Million Flood Fund for State," *Albuquerque Journal,* 12 February 1949. The remaining $100,000 in Chavez's request was for studies of the Pecos River basin near Roswell by the Albuquerque District.

[20]T. A. Blair, Chief of Engineers, Santa Fe Railway, Chicago, Illinois, to the Commission on Public Works, U.S. Senate, 21 May 1948; Major Kenneth D. Nichols, Sandia Base, Albuquerque, to Chavez, n. d.; David E. Lilenthal to Chavez, 7 April 1949, all in Rio Grande Compact File, Governor Thomas Mabry Papers, NMSRCA.

[21]Chavez to John P. Murphy, Executive Secretary, Middle Rio Grande Flood Control Association [MRGFCA], Albuquerque, 22 April 1949, RGB, SEO. By law the Army Corps of Engineers could not contract with regular governmental entities for construction of flood control works. The MRGFCA was created under New Mexico statute to levy bonds and assessments on property owners, and to maintain all such facilities once the Corps had built them.

[22]John H. Bliss, New Mexico State Engineer, to Governor Thomas Mabry, Santa Fe, 10 November 1949; Chavez to Bliss, 16 December 1949, both in RGB, SEO; *Annual Report, 1949,* pp. 1216-17.

[23]"Notes for Discussion of Relations with Department of the Interior," Civil Works File No. 1, Samuel D. Sturgis Papers, Historical Division, OCE.

[24]"Notes for Discussion," Sturgis Papers.

[25]Civil Functions, Department of the Army, Appropriations Hearings for 1953, 82nd Congress, 2nd session, p. 1555.

[26]Memorandum of Sturgis to the Civil Works Division, OCE, 27 December 1954, Civil Works File No. 1, Sturgis Papers.

[27]*Annual Report, 1951,* pp. 1029-30; Ibid., 1952, pp. 979-80; Ibid., 1953, pp. 886-87; Ibid., 1954, pp. 635-36.

[28]Fred A. Thompson, Director, New Mexico Department of Game and Fish, to Governor Edwin L. Mechem, Santa Fe, 17 July 1958; Oscar M. Love to Anderson, 12 June 1958; "Commission Urges Jemez Lake Be Made Permanent," *Albuquerque Journal,* 13 June 1958; Oren W. Strong, Potentate, Ballut Abyad Temple, Albuquerque, to Steve Reynolds, New Mexico State Engineer, 11 June 1958, all in RGB, SEO; Loughridge interview; Redmond interview; Blum interview. The District estimated that 13,000 people visited Jemez Canyon Dam on Memorial Day, 1958. Vendors of all sorts of foods and beverages lined the roads

leading into the project, and boaters spent the weekend sailing on the "lake" even though no ramps or docks existed.

VII

[1]"Report on the Rio Grande and Tributaries, New Mexico," 27 June 1949, House Document 243, 8st Cong., 1st sess.

[2]Ibid., pp. xl-xlii.

[3]Ibid., pp. xiv-xxxi.

[4]"Statement of Louis A. Scott, Rio Grande Compact Commissioner for Texas," Abiquiu-Chamita Project, Public Works Appropriations, 1957, Senate Hearings on HR 11319, 84th Cong., 2nd sess., pp. 804-05; Flood Control Act of 1948, Public Law 81-516, Chapter 188, 2nd sess. (64 Stat. 176); Loughridge interview; Gilmer interview; *Annual Report, 1948,* p. 1340; Ibid., 1949, p. 1216; Ibid., 1950, pp. 1240-41; Ibid., 1951, pp. 1028-29; Ibid., 1952,pp. 978-79.

[5]Colonel Lynn C. Barnes to John H. Bliss, New Mexico State Engineer, 18 September 1953, RGB, SEO; *Annual Report, 1953,* pp. 884-85; Raymond A. Hill, Engineer Advisor for the Texas Water Commission, to Louis A. Scott, 23 March 1956, Public Works Appropriations 1957, Senate Hearings on HR 11319, 84th Cong., 2nd sess., pp. 810-12.

[6]"Statement of Louis Scott," p. 805; *Annual Report, 1953,* pp. 884-85.

[7]"Statement of Louis Scott," p. 805; Allan Shivers, Governor of Texas, to Sturgis, 27 April 1954; Barnes to Scott, 2 December 1954, both in 1957 Public Works Appropriations Report; *Annual Report, 1954,* pp. 633-34.

[8]*Annual Report, 1956,* pp. 802-03; Colonel Robert E. Cron, Jr., to Senator Clinton Anderson, 10 July 1956, Anderson Papers, Manuscript Division, Library of Congress [Hereafter cited as MD, LC].

[9]John L. Gregg, Treasurer-Manager, Elephant Butte Irrigation District of New Mexico, to Steve Reynolds, 29 May 1957; Anderson to Reynolds, 29 May 1957; Senate Bill 1991, "A Bill to Provide that the United States may be joined as a defendant in certain suits or controversies in the Supreme Court of the United States involving the Rio Grande Compact," 8 May 1957, 85th Cong., 1st sess., all in RGB, SEO.

[10]"Statement of Louis Scott," pp. 805-806; Public Works Appropriations, 1957, 84th Cong., 2nd sess., House Hearings, pp. 496-97; Henry F. Hannis, President, MRFGCA, to Reynolds, 12 December 1956; Reynolds to Scott, 2 March 1956, both in RGB, SEO. Henry F. Hannis served as Albuquerque District Engineer from May 1946 to June 1948, making his support for the Abiquiu changes all the more evidence for Texas that New Mexico politicians held sway over the employees of the Corps.

[11]Joe Lawler, Managing Editor, *Santa Fe New Mexican,* to U. S. Representative John J. Dempsey, 16 April 1956; Major General Emerson C. Itschner, Assistant Chief of Engineers for Civil Works, to Dempsey, 27 April 1956, both in Corps of Engineers Files, Dempsey Papers, NMSRCA; *Santa Fe New Mexican,* 6, 7 May 1956. After his stint with the Santa Fe paper, Tony Hillerman launched a second career as one of the most famous Southwestern novelists of the 1970s and 1980s.

[12]*Annual Report, 1957,* pp. 782-83; Public Works Appropriations, 1959, 85th Cong., 2nd sess., House Hearings, pp. 788-89.

[13]Loughridge interview; Paul M. Dunaway, "New Tools for Earth-Dam Construction," *Civil Engineering,* 30 (September 1960): 35-37; "Dambuilders Can Go Push-Button, Too," *Engineering News-Record,* 169 (19 July 1962): 28-30, 35-36.

[14]Public Works Appropriations, 1959, 85th Cong., 2nd sess., Senate Hearings on HR 12858, pp. 2513-15; Public Works Appropriations, 1960, 86th Cong., 1st sess., Senate Hearings on HR 7509, pp. 1558-59; *Annual Report, 1959,* pp. 780-81.

[15]*Annual Report, 1963,* pp. 761-62.

[16]*Santa Fe New Mexican,* 16 December 1962.

[17]S. E. Reynolds, New Mexico State Engineer, "Memorandum to Files for Information," 31 January 1963, Abiquiu 1962-68 Files, SEO.

[18]Gilmer interview; Arturo Sandoval, "Abiquiu Dam Causes Controversy," *Seers Magazine,* 24 September 1976: 1-3; Bill Keller, Oficina de Ley del Pueblo, Tierra Amarilla, New Mexico, to Brant Calkin, Sierra Club, Santa Fe, 15 May 1978; Calkin to the Albuquerque District, 15 January 1976, both in WM 600.2 Abiquiu Dam File, Sierra Club Records, Southwest Office, Santa Fe [Hereafter cited as SCR, SWO].

[19]"Rio Chama-Abiquiu Dam Public Meeting Handout," 6 October 1979, Espanola, New Mexico, SCR, SWO.

[20]James W. Hall, Abiquiu, New Mexico, to Calkin, 26 August 1976, SCR, SWO.

[21]Report of Colonel Romano J. Parini, Military Police Corps, Southwestern Divison, 10 June 1976; Maj. Gen. Ernest Graves, Deputy Director of Civil Works, OCE, to Albuquerque District Engineer, 2 July 1976, both in 1520-01 Abiquiu Dam File, Albquerque District Records, Box 2, RG 77, WNRC. Although Corps officials connected Tijerina to the suspects at the dam, the Hispanic leader had been in Mexico at the time, seeking support from the Mexican president, Luis Echeverría, for his requests to return Spanish and Mexican land grants to their orignal owners.

[22]Gilmer interview; interview with Brant Calkin, Secretary, Department of Natural Resources, State of New Mexico, 21 March 1984, Santa Fe.

VIII

[1]"Interim Report on Main Stem of the Rio Grande Above Elephant Butte, NM," U.S. Army Corps of Engineers, 29 April 1960, U.S. Congress, Senate, S.Doc. 94, 86th Cong., 2nd sess., pp. 27-28.

[2]Carol Wilson, "House Resolution 323 and Inundation of Pueblo Lands," unpublished manuscript, Phi Alpha Theta Award Papers, 1979, University of New Mexico, History Department, p. 1.

[3]Ibid., p. 2. Federal officials in attendance at the 1942 meeting denied coercion of the Pueblo Indian leaders.

[4]*Albuquerque Journal,* 13 February 1943.

[5]Wilson, "HR 323," pp. 4-5.

[6]Charles H. Lange, *Cochiti: A New Mexico Pueblo, Past and Present* (Carbondale: Southern Illinois University Press, 1959, 1968), pp. 4-9.

[7]The best source on the Pueblo land problems of the late 19th and early 20th centuries is Lawrence Kelly, *The Assault on Assimilation: John Collier and the Origins of Indian Policy Reform* (Albuquerque: University of New Mexico Press, 1983). See also Kelly, "John Collier and the Pueblo Lands Board Act," *New Mexico Historical Review,* 58 (January 1983): 5-34. The Bursum bill resulted from the desire of Albert Fall, Secretary of the Interior and a former U.S. senator from New Mexico, to loosen regulations protecting Indian land, water, and energy resources in the West. Holm O. Bursum, Fall's successor in the Senate, introduced the legislation at a time when business interests influenced the Harding administration. Non-Indian interest groups then formed to oppose this and similar policies.

[8]"Statement by John Patrick Murphy, Executive Secretary, Middle Rio Grande Flood Control Association," 11 April 1960, Public Works Appropriations, 1961, 86th Cong., 2nd sess., House Hearings, p. 985.

[9]Reynolds to the Chief of Engineers, 19 November 1959; Fred G. Aandahl, Assistant Secretary of the Interior, to Itschner, 8 February 1960; E. L. Peterson, Assistant Secretary of Agriculture, to the Secretary of the Army, 3 February 1960; G. E. McCallum, Chief, Division of Water Supply and Pollution Control, Public Health Service, Department of Health, Education and Welfare, to Itschner, 11 January 1960; Jason K. Kuykendall, Chairman, Federal Power Commission, to Itschner, 24 December 1959, all in "Interim Report on Main Stem of the Rio Grande Above Elephant Butte Dam, NM," 29 April 1960, S. Doc. 94, 86th Cong., 2nd sess.

[10]Itschner to the Secretary of the Interior, 11 March 1960; Major General W. K. Wilson, Jr., Acting Chief of Engineers, to McCallum, 1 February 1960; Reynolds to Itschner, 19 November 1959, all in "Interim Report on the Main Stem of the Rio Grande," 1960.

[11]Interview with C. Philip Corkle, Office of Trust Responsibility, Bureau of Indian Affairs, 3 March 1983, Washington, DC.

[12]Ibid.

[13]The "termination" policies of the federal government have been studied in Larry W. Burt, *Tribalism in Crisis: Federal Indian Policy, 1953-61* (Albuquerque: University of New Mexico Press, 1982).

[14]The involvement of the Corps with the tribes on the Missouri River is chronicled in Lawson, *Dammed Indians.*

[15]Alfred Herrera, Governor, Pueblo de Cochiti, to the Board of Engineers for Rivers and Harbors, U.S. Army, Washington, DC, 15 April 1959,Cochiti 1959 Files, SEO.

[16]Ibid.

[17]Report of the Board of Engineers for Rivers and Harbors, 21 July 1959, "Interim Report on Main Stem of the Rio Grande," 1960.

[18]Peterson to Itschner, 3 February 1960, "Interim Report on Main Stem of the Rio Grande," 1960.

[19]Nash, *American West in the Twentieth Century,* pp. 219-28.

[20]Reynolds to Anderson, 29 September 1959, Cochiti 1959 Files, SEO.

[21]Raymond A. Hill, Consulting Engineer, Leeds, Hill and Jewett, Los Angeles, California, to Colonel Albert L. Reed, Albuquerque District Engineer, 17 November 1958; "Statement by Louis A. Scott, Rio Grande Compact Commissioner for Texas," 26 November 1958, both in Cochiti 1958 Files, SEO.

[22]John C. Gatlin, Regional Director, Bureau of Sport Fisheries and Wildlife, Albuquerque, to Fred A. Thompson, Director, New Mexico Department of Game and Fish, 17 December 1958, Cochiti 1958 Files, SEO.

[23]Draft Letter of Gatlin to Reed, 17 December 1958; Inter-Office Memorandum of Jack G. Koogler, Chief, Design and Construction Section, MRGCD, "Cochiti Dam Project — Water Rights for Fish and Wildlife Program," 19 December 1958, both in Cochiti 1958 Files, SEO.

[24]Fred A. Thompson to Maurice Sanchez, Albuquerque City Commission, 7 April 1959, Cochiti 1959 Files, SEO; Reynolds to Board of Engineers for Rivers and Harbors, 27 April 1959, Clinton P. Anderson Papers, MD, LC.

[25]Reynolds to Anderson, 29 September 1959, Cochiti 1959 Files; Alfred Herrera to the Secretary of the Interior, 8 December 1959; Guy C. Williams, General Superintendent, United Pueblos Agency, Albuquerque, to the Area Director, Gallup Area Office, Bureau of Indian Affairs, 11 December 1959; Williams to Reynolds, 8 January 1960, all in Cochiti 1960-61 Files, SEO.

[26]Reynolds to Anderson, 29 September 1959; Memorandum of Reynolds to Office File, 3 October 1959, both in Cochiti 1959 Files, SEO.

[27]Public Works Appropriations, 1958, 85th Cong., 1st sess., House Hearings, Part One, p. 1171.

[28]*Annual Report, 1961,* pp. 844-45.

[29]Ibid., pp. 845-46.

[30]"Another Opportunity Being Lost," *Santa Fe New Mexican,* 26 July 1960.

[31]Reynolds to Tony Hillerman, Executive Editor, *The New Mexican,* Santa Fe, 1 August 1960, Cochiti 1960-61 Files, SEO.

[32]Anderson to Hillerman, 19 August 1960, Cochiti 1960-61 Files, SEO, Anderson's support for Cochiti recreation storage at federal expense was contradicted in 1965 when water sports enthusiasts pressured his Republican colleague from Colorado, Senator Gordon Allott, to create a permanent pool of 10,000 acre-feet at the Albuquerque District's John Martin Dam. Allott asked Anderson for his vote against the measure sponsored by Representative Frank Evans of Colorado. Anderson this time spoke for irrigators, saying: "We have trouble constantly with the effort to create these permanent pools which may upset the people who depend upon irrigation for farms along the [Arkansas] river." [Anderson to Allott, 24 August 1965, John Martin Dam File, Allott Papers, WHC, UC].

[33]Reynolds to Stewart Udall, Secretary of the Interior, 12, 18 June, 1962, Cochiti 1962-65 Files, SEO.

[34]Reynolds to Edwin L. Mechem, Governor of New Mexico, 15 August 1962,

Cochiti 1962-65 Files, SEO.

[35]*Annual Report, 1963,* pp. 763-65.

[36]Resolution of the Cochiti Pueblo Council, 17 March 1963, MRGCD Records, Albuquerque.

[37]Reynolds to Representative Joseph M. Montoya, 26 March 1964; Elmer B. Staats, Deputy Director, Bureau of the Budget, to U.S. Senator Edwin L. Mechem, 14 Febraury 1964, both in Cochiti 1962-65 Files, SEO.

[38]Gatlin to District Engineer, 16 October 1963; Montoya to Reynolds, 2 April 1964, both in Cochiti 1962-65 Files, SEO; "Statement of Honorable Clinton P. Anderson, a U.S. Senator from the state of New Mexico, Cochiti and Galisteo Dams and Reservoirs," Public Works Appropriations, 1965, 88th Cong., 2nd sess, Senate Hearings on HR 11579, pp. 2089-90; *Annual Report, 1965,* pp. 692-93.

[39]*Annual Report, 1965,* p. 693.

[40]Ibid. The radical movements of the 1960s raised awareness of minority rights nationwide, but were hard to understand at first. The District employees who had received good initial responses from OCE in 1959 on their request for condemnation of Cochiti lands could only wonder at the change of attitude by 1964.

[41]Loughridge interview; Brown interview; Redmond interview.

[42]"Memorandum of Understanding Between Corps of Engineers and Pueblo of Cochiti," 16 November 1965, Fernando A. Cordero, Governor, Pueblo de Cochiti, and Colonel Gerald W. Homann, District Engineer, Cochiti 1966-74 Files, SEO.

[43]Fernando Cordero to Joseph Montoya, 22 November 1965, Montoya Papers, SC, UNM.

[44]Corkle interview.

[45]"Remarks by the Honorable Joseph M. Montoya at Formal Ceremony Transferring Easement to the Corps of Engineers for Cochiti Dam and Reservoir, Cochiti Pueblo, 12 December 1965," Montoya Papers, SC, UNM.

[46]Ibid.

[47]*Annual Report, 1967,* pp. 742-43; Ibid., 1969, pp. 552-53; Ibid., 1971, pp. 17-8 (after 1970 the citations were numbered 17-1, 17-2, 17-3, etc.).

[48]*Albuquerque Tribune,* 16 May 1968.

[49]Carl H. Schwartz, Jr., Natural Resources Programs Division, Bureau of the Budget, to Edward Jory, President, Albuquerque Industrial Development Service, Inc., 29 May 1969, Montoya Papers, SC, UNM.

[50]L. G. Zartman, Chairman, Board of Directors, MRGCD, to Clinton Anderson, 27 May 1969, MRGCD Records; Pete V. Domenici, Chairman, Albuquerque City Commission, to Montoya, 16 May 1969, Montoya Papers, SC, UNM.

[51]Loughridge interview; Brown interview; Redmond interview.

[52]Joe B. McNabb, Senior Vice President, Guy V. Atkinson and Company, to Anderson, 22 November 1971, Montoya Papers, SC, UNM.

[53]Montoya to Senator John C. Stennis, Mississippi, Chairman, Public Works Appropriations Subcommittee, 26 October 1971; Press Release, "Montoya Calls Upon Newsmedia to Assist Progress of Spanish-American Community," 6 June 1969, both in Montoya Papers, SC, UNM.

[54]"Statement of Concern: Prepared by the Emergency Committee on Employment," Pena Blanca, New Mexico, 22 February 1971, Montoya Papers, SC, UNM.

[55]Montoya to Stanley A. Resor, Secretary of the Army, 6 April 1971; Montoya to Miguel Pena y Montoya, Pena Blanca Community Council, Inc., 25 March

1971; Colonel Richard F. McAdoo, Executive, OCE, to Montoya, 26 April 1971, all in Montoya Papers, SC, UNM.

[56]McNabb to Anderson, 9 February 1971; McNabb to Montoya, 27 August 1971, all in Montoya Papers, SC, UNM.

[57]Lloyd E. Anderson, Acting Resident Engineer, Cochiti Project, Albuquerque District, to Montoya, 28 November 1973, Montoya Papers, SC, UNM.

[58]Major Thomas B. Russell, Corps of Engineers, "Closure at Cochiti Dam," *The Military Engineer* 66 (May-June 1974): 180-181; *Albuquerque Journal,* 13 November 1973.

[59]Memorandum, J. L. Whiteman, Chief, Design and Construction Section, New Mexico State Engineer's Office, "Seepage of irrigated lands below the Cochiti East Side Main Canal in the vicinity of Pena Blanca, New Mexico," 1 September 1976; "Statement of Record, Public Meeting — Pena Blanca, Albuquerque District, Corps of Engineers," 10 April 1980, both in Cochiti 1975-81 Files, SEO.

[60]*Annual Report, 1979,* p. 17-7. The large volume of water held by Cochiti Dam in June 1979 contained hundred of tons of silt that the District felt threatened farmers' fields below. By retaining the flood flows until safe levels of releases could occur, the District calculated sediment protection that year at $190,400.

[61]Corkle interview; Cargo interview.

[62]Reynolds to Claude Wood, Administrative Assistant to Clinton P. Anderson, 22 January 1971, Cochiti 1966-74 Files, SEO; Telegram, Pete V. Domenici, Chairman, Albuquerque City Commission, et al., to Montoya, 1 May 1969, Montoya Papers, SC, UNM.

[63]N. K. Mendelsohn, President, California City Development Corporation, Los Angeles, to Celso Montoya, Governor, Pueblo de Cochiti, 26 May 1969, Montoya Papers, SC, UNM.

[64]Reynolds to Wood, 22 January 1971; Colonel Robert G. MacLennan, Albuquerque District Engineer, to Joe H. Herrera, Governor, Pueblo de Cochiti, 8 November 1974, Montoya Papers, SC, UNM.

[65]Interview with Christian Mosebach, Project Manager, Cochiti Dam and Reservoir, 10 June 1983, Cochiti Lake, New Mexico.

[66]Interview with Lt. Col. Julian E. Pylant, Albuqerque District Engineer, 6 July 1984, Albuquerque, New Mexico.

IX

[1]"Examination and Survey of Rio Grande and Tributaries, New Mexico," 17 June 1949, H. Doc. 243, 81st Cong., 1st sess., x-xi.

[2]*Annual Report, 1948,* pp. 1339-40.

[3]Colonel Herbert D. Vogel, Division Engineer, to Sturgis, 3 April 1953, SWD file, Sturgis Papers; *Annual Report, 1953,* pp. 887-88.

[4]Carl H. Schwartz, Chief, Resources and Civil Works Division, Bureau of the Budget, to the Secretary of the Army, 7 June 1954; E. L. Mechem, Governor of New Mexico, to Sturgis, 17 March 1954, "Review of Reports on the Rio Grande and Tributaries, Albuquerque, NM," 6 July 1954, both in U. S. Congress, House, H. Doc. 464, 83rd Cong., 2nd sess.

[5]Report of the District Engineer, Albuquerque, 20 June 1953, H. Doc. 464, 83rd Cong., 2nd sess., pp. 6-19; "Statement by Senator Anderson in Support of the Flood Control Plan for Albuquerque, NM, and Vicinity," 2 June 1954, Anderson Papers, MD, LC.

[6]H. Doc. 464, 83rd Cong., 2nd sess., pp. 16-19.

[7]Daily Log-Civil Works, Fiscal Year 1956, Box 2 (January-May 1956); Daily Log-Civil Works, Fiscal Year 1956, July-December, 1958 Files 1 and 2; Daily Log-Civil Works, Fiscal Year 1956, January-May 1956, File 1, all in Sturgis Papers.

[8]Harold E. Kious, Finance Director, "Attachment to Application for Projects Connected with Albuquerque Major Disaster Area," 28 August 1955, Conservation File, Governor John Simms Papers, NMSRCA; *Annual Report, 1956,* pp. 806-07.

[9]Reynolds to E. F. Hensch, City Engineer, Albuquerque, 23 July 1968, RGB, SEO.

[10]State Engineer's Office, Albuquerque Flood Control, "Proposed Stop-Gap Measures," 9 March 1956, Conservation File, Simms Papers, NMSRCA.

[11]John P. Murphy, Executive Secretary, MRGCD, to Edwin L. Mechem, 21 February 1958, RGB, SEO.

[12]Mechem to Dwight D. Eisenhower, President of the United States, 27 February 1958, MRGCD Records.

[13]Sherman Adams, Assistant to the President, to Mechem, 14 March 1958, RGB, SEO.

[14]Mechem to Adams, 24 March 1958, RGB, SEO.

[15]Adams to Mechem, 8 April 1959, RGB, SEO.

[16]*Annual Reports, 1959,* pp. 786-87.

[17]Frances McCoy, Director, Albuquerque Metropolitan Arroyo Flood Control Authority, "AMAFCA Flood Control Program," 1 October 1966, Anderson Papers, MD, LC.

[18]*Annual Report,1965,* pp. 684-85; B. H. Swinburne, Chairman, Board of Directors, AMAFCA, to Senator Joseph M. Montoya, 23 May 1969; "Statement of David F. Cargo, Governor of the State of New Mexico, to the Subcommittee on Public Works Appropriations of the Appropriations Committee of the U. S. Senate," 3 June 1969, both in Montoya Papers, SC, UNM.

[19]*Annual Report, 1972,* pp. 17-1, 17-2; AMAFCA Press Release, 22 November 1982.

X

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